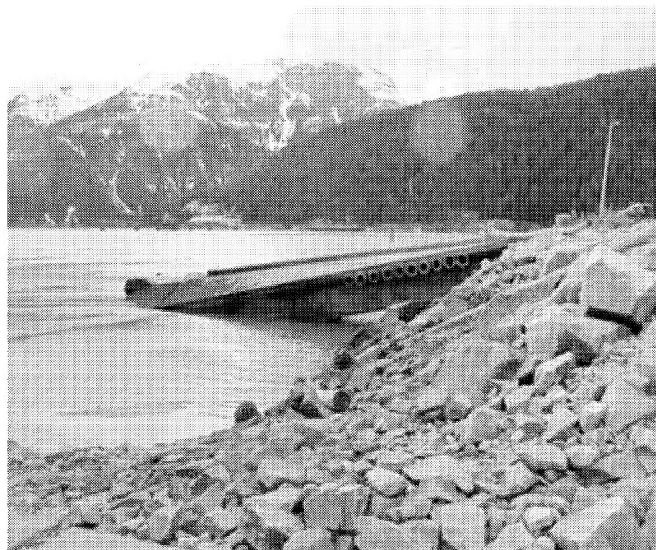


BALANCED ENVIRONMENTAL

AQUATIC EFFECTS ASSESSMENT

BARGE RAMP RELOCATION PROJECT
STEWART, BRITISH COLUMBIA
DFO # 12-HPAC-PA4-00248 | BALANCED # 5397-R-05.2

October 25, 2012



ABOUT THIS REPORT

PREPARED FOR:

Bradley Koroluk, Habitat Management Biologist
Ecosystems Management Branch, BC North Coast
Fisheries and Oceans Canada
Box 130, Bella Coola, BC
V0T 1C0

Office: 250-799-5729
Fax: 250-799-5540
Web: <http://www.pac.dfo-mpo.gc.ca/habitat/index-eng.htm>
Email: Bradley.Koroluk@dfo-mpo.gc.ca

PREPARED BY:

Warren Appleton, Senior Project Biologist
Balanced Environmental Services Inc.
118 Garden Ave, North Vancouver, BC.
V7P 3H2

Office: 604-988-3033
Fax: 604-988-3026
Web: <http://www.balanced.ca/>
Email: warren@balanced.ca

COMMISSIONED BY:

Brad Moffat, Project Manager
Stewart World Port Services Ltd.
11421 Alaska Road, Fort St. John, BC
V1J 6N2

Office: 250-785-8995
Email: bmoftat@stewartworldport.com

SIGNATURES:

This report has been prepared by Balanced Environmental Services Inc.

AUTHOR



Warren Appleton, R.P.Bio
Senior Project Biologist

REVIEWED/APPROVED BY*



Scott Christie, R.P.Bio
Principal

*Persons with signing authority on behalf of Balanced Environmental Services Inc.

SCOPE OF WORK

SUMMARY OF SCOPE

Balanced Environmental Services Inc. (Balanced Environmental) has been secured by Stewart World Port Ltd. (the Proponent) to create an Aquatic Effects Assessment report for presentation to Fisheries and Oceans Canada (DFO) in response to DFO's letter dated August 22, 2012 for the Barge Ramp Relocation Project located in Stewart, British Columbia (Koroluk, 2012a - Appendix 1). The scope of work includes the following:

- the complete foreshore/intertidal fish habitat assessment report for the proposed area,
- the habitat compensation plan, including mitigation measures to offset the loss of fish habitat,
- a monitoring plan that will ensure habitat compensation and mitigation measures function properly,
- additional information and clarification regarding the means of assessment and measures to protect SARA listed species which may use this area, and
- an assessment of fish presence/absence and utilization of this area; including salmonids, eulachon and herring, and any mitigation measures that will minimize or avoid negative impacts to them.

REPORT LIMITATIONS

The intent of this report is to provide technical information related to the proposed project in support of an application by the Proponent for Authorization under the *Fisheries Act*.

The report is considered preliminary until it has been signed by persons with signing authority on behalf of Balanced Environmental. Preliminary reports are for discussion purposes only and may change without notice. All signed reports are released by Balanced Environmental to the company that commissioned the report.

Balanced Environmental reserves the right to amend, clarify, or retract this report at any time without notice if, in the opinion of Balanced Environmental, the report is being misrepresented, or if Balanced Environmental becomes aware of any conflicts with the code of ethics, municipal, provincial or federal legislation, or is required to do so by law.

Balanced Environmental is not permitted to discuss the particulars regarding this report to any 3rd party without the consent of the commissioner of the report unless required to do so by law. Please contact the commissioner of the report to obtain approval to discuss this with Balanced Environmental.

This report represents the opinion of Balanced Environmental not the individuals identified in the report. This report does not constitute approval under any municipal, provincial or federal legislation.

TABLE OF CONTENTS

ABOUT THIS REPORT	i
SCOPE OF WORK.....	ii
TABLE OF CONTENTS	iii
SECTION 1 – INTRODUCTION	1
1.0 – General.....	1
1.1 – Project Location	1
1.2 – Project Justification	1
1.3 – Project Support	2
1.4 – First Nations	2
SECTION 2 – PROJECT DESCRIPTION	4
2.0 – General.....	4
2.1 – Project Components	4
2.2 – Materials	4
2.3 – Methodology	5
2.4 – Timeline	5
2.5 – General Arrangement Plan	5
SECTION 3 – EXISTING CONDITIONS.....	10
3.0 – General.....	10
3.1 – Physical Conditions	10
3.2 – Biological Conditions.....	10
3.3 – Fish Presence and Usage	13
3.4 – Species at Risk and Marine Mammals	13
SECTION 4 – IMPACTS.....	15
4.0 – General.....	15
SECTION 5 – MITIGATION MEASURES	17
5.0 – General.....	17
5.1 – Project Design	17
5.2 – Construction of Causeway	17
5.3 – Construction of Pile Structures	17
5.4 – Impacts to Fish	17

SECTION 6 – COMPENSATION PLAN.....	18
6.0 – General.....	18
6.1 – Target Species	18
6.2 – Enhancement Options	18
6.3 – Proposed Compensation.....	18
6.4 – Added Value Enhancements	19
 SECTION 7 – MONITORING PLAN	 22
7.0 – General.....	22
7.1 – Site Preparation	22
7.2 – Construction of Causeway and Habitat Compensation	22
7.3 – Construction of Pile Structures	22
7.4 – Species at Risk and Marine Mammal Monitoring.....	22
7.5 – Project Completion	23
7.6 – Post Construction Monitoring	23
 REFERENCES	 25
 DRAWINGS	
Location Map.....	3
Engineering Drawings	6
Biophysical Drawing	11
Project Impact Drawing	16
Habitat Compensation Plan Drawings.....	20
 TABLES	
Table 1 – Observed Species List	12
Table 2 – Habitat Balance Sheet	15
 APPENDICES	
Appendix 1 – DFO Correspondence	
Appendix 2 – First Nations Correspondence	
Appendix 3 – FISS Database Results	
Appendix 4 – DFO Application Form	
Appendix 5 – Pile Driving BMPs	
Appendix 6 – Salt Marsh Construction Budget	

BARGE RAMP RELOCATION PROJECT STEWART, BRITISH COLUMBIA

SECTION 1 – INTRODUCTION

1.0 GENERAL

The barge ramp relocation project involves replacement of a failing timber barge ramp located at the end of an the existing Cassiar dock with a new barge ramp to be located in deeper water at the off shore end of a nearby causeway. The causeway is approximately 175m long by 50m wide and the barge ramp is roughly 40m long with 3 sets of pile dolphins necessary for securing barges. The facility will be able to accept barges up to 6,000 dwt ranging in size from 45m to 85m in length and 15m to 25m in width. Currently there is no operational barge ramp in the area.

The project will require placement of fill in the intertidal with the majority of fill placed between 0m and 2m chart datum. Installation of approximately 24 1067mm diameter steel piles will also be required down to a maximum of -11m chart datum. The project will not require any dredging.

No critical habitat was observed during a biophysical survey of the site by a team of Qualified Environmental Professionals (QEPs). Project impacts are expected to be primarily related to loss of water column. Mitigation measures related to project activities are proposed, including ensuring compliance with Best Management Practices for Pile Driving and following Water Quality Guidelines. Proposed habitat enhancement opportunities are focussed on improving habitat for juvenile coho salmon and associated fish species by constructing 1,865 square metres of new salt marsh habitat.

1.1 PROJECT LOCATION

The project is focused on an existing marine facility located at the head of the Portland Canal in Stewart British Columbia. The legal description of the site is DL7318 Stewart, B.C. and the latitude / longitude of the site is 55.918 N / -129.995W. From Terrace, B.C., drive west to Kitwanga, drive north on highway 37 to the Meziadin Junction, turn left on Highway 37a, drive to the Stewart town site, and drive to the end of Railway St. to reach the existing Cassiar dock. See attached Balanced Drawing 5397-D-01.2 for more information.

1.2 PROJECT JUSTIFICATION

The existing barge ramp is no longer operational. Natural sedimentation and infilling from the Bear River have raised the seabed up to 3m chart datum at the current barge ramp location. The proposed project will relocate the barge ramp to deeper waters at -7m chart datum.

With depths impassable around the existing barge ramp and vehicle size restrictions on bridges leading in to Stewart, the only option for heavy machinery to access Stewart is through grounding barges and running equipment up and down the foreshore, which can result in disruption to marine habitat. Furthermore, the nearby AltaGas Forrest Kerr Project must receive two generators and two stators by December 2012 which can only be accomplished with the completion of a new barge ramp facility. As the equipment cannot cross the Nass River from the south or the Bell Irving River from the north, the Forrest Kerr Project will be unable to complete construction of the facility. Additionally, because the trailers carrying the equipment must bypass the town of Stewart, the only transportation route available requires deep water access off the Cassiar dock in

Stewart. Without this, the project has absolutely no other way to receive this equipment and complete their construction (Moffat, 2012).

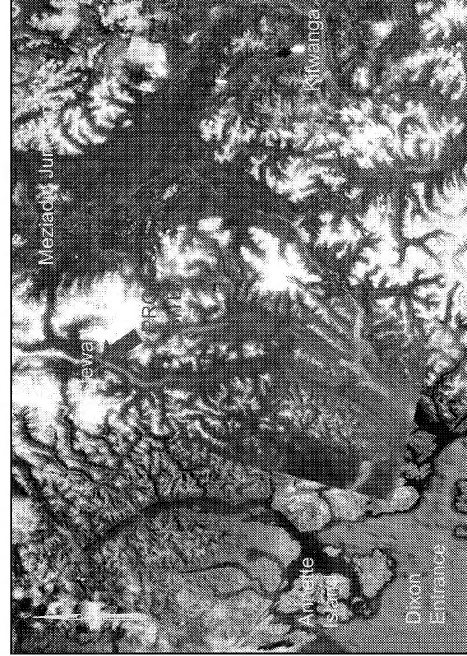
The proposed causeway design incorporates primarily fill material instead of piling. This is required to minimize maintenance requirements, increase design life and make the project economically viable.

1.3 PROJECT SUPPORT

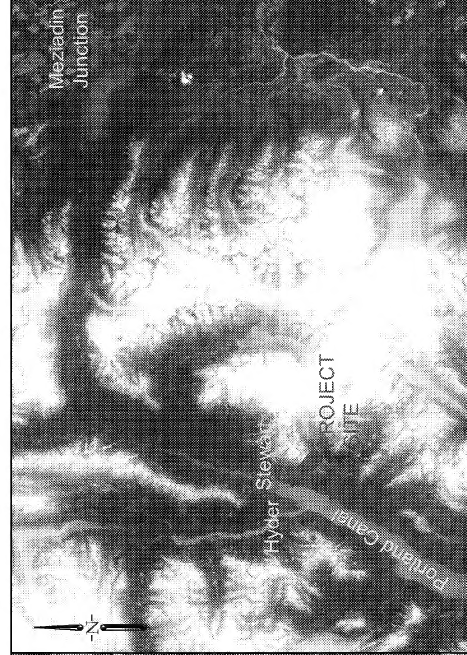
The project has received support from the local businesses (Wyprysky, 2012), the residents of Stewart (Moffat, 2012), Stewart Mayor and Council (Durant, 2012), local MLA (Pimm, 2012), the BC Ministry of Transportation and Infrastructure (Byng, 2012), and many businesses in Stewart's hinterland (Moffat, 2012).

1.4 First Nations

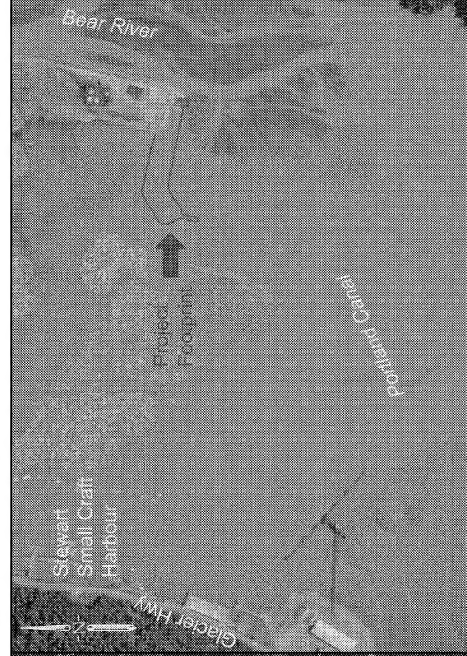
The First Nations Nisga'a Lisims government has been contacted by DFO for comment regarding their interests in the project and project site on August 29 and September 25, 2012 (Appendix 2 - First Nations Correspondance), as yet no reply has been received.



LOCATION CHART 1 : 2,000,000



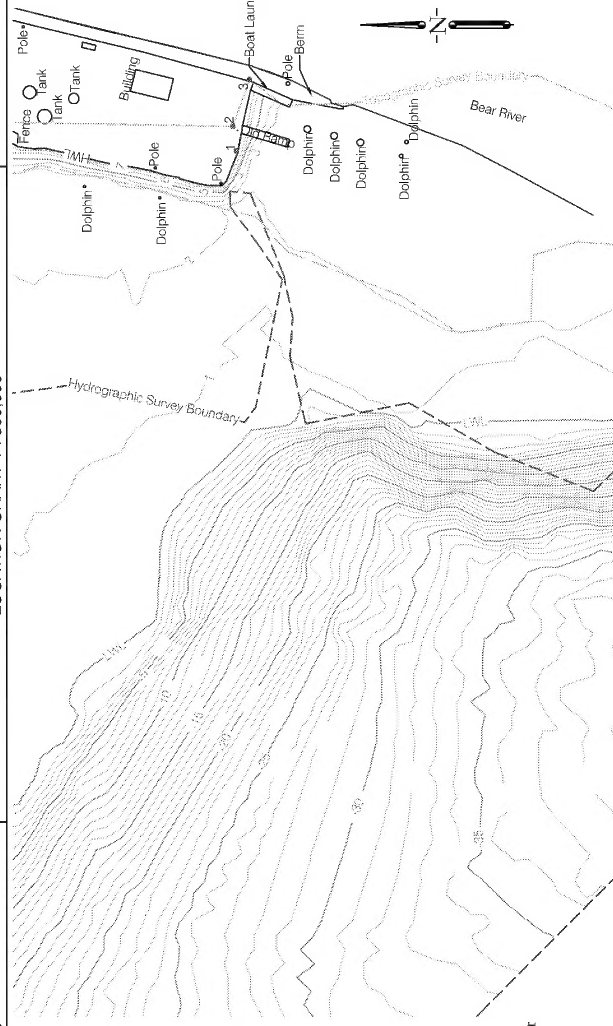
LOCATION CHART 1 : 500,000



LOCATION CHART 1 : 10,000

DRAWING NOTES

- Drawing notes apply to Drawings 5397-D-01.1 and 5397-D-02.1.
- Not an As-Built drawing.
- All elevations are in metres and related to chart datum via the Stewart Harmonic Station (CHS) Tides and Currents Pro v. 3.5.107 accurate to $\pm 0.3m$.
- Hydrographic, topographic and biophysical surveys were conducted on May 1 and 2, 2012.
- Intertidal biophysical location information was collected using either a total station or dGPS.
- General underwater biophysical information was collected by making a series of dives throughout the survey area. Observations were located relative to existing structures onsite.
- The information, including elevation and biophysical data, presented on the drawings may vary from current conditions due to the passage of time or seasonal changes in substrate and biota.
- The data presented on the drawings represents, in general terms, the substrate and biota types.
- Contour data between the limits of the hydrographic and topographic surveys is extrapolated.
- According to Cambria Gordon 2011, the high water mark for the site is approximately 7.67m chart datum.
- To convert to Geodetic, subtract 3.713 metres.



LEGEND

- Existing Structures
- 1.0m Contour
- 5.0m Contour
- Low Water (LWL) (0m Chart Datum)
- High Water (HWL) (7.67m Contour)
- Hydrographic Survey Boundary
- Topographic Survey Boundary
- Survey Reference Point

SURVEY REFERENCE POINTS

- Reference Point 1
 - Canada Hydrographic Services # 85 79600
 - Tide & Currents: 7.84m Chart Datum
- Reference Point 2
 - Observation Monitoring Well
- Reference Point 3
 - Tide Program: 7.84m Chart Datum
 - BC Legal Survey Monument #2002 SL 7318 WT 4.446 509
 - Tides & Currents: 6.99m Chart Datum



Client		Author		PROJECT	
ARCTIC CONSTRUCTION		WA		LOCATION MAP	
11421 Alaska Road		DC		BARGE RAMP RELOCATION PROJECT,	
Fort St. John, BC		Date		STEWART, BRITISH COLUMBIA	
V1J 6N2		July 11, 2012			
		Scale			
		1:3500			
		Inspectors			
		WA, DC, KF			
		Paper			
		11 x 17			
				DWG. No.	
				5397-D-01.2	

SECTION 2 – PROJECT DESCRIPTION

2.0 GENERAL

The barge ramp relocation project involves replacement of a failing timber barge ramp located on the end of an existing Cassiar dock with a new barge ramp located in deeper water at the end of the causeway. The causeway is approximately 175m long by 50m wide and the barge ramp is roughly 40m long with 3 sets of pile dolphins necessary for securing barges. The facility will be able to accept barges up to 6,000 dwt ranging in size from 45m to 85m in length and 15m to 25m in width.

2.1 PROJECT COMPONENTS

The project will include construction of the following components:

- A) Causeway Construction
 - 175m in length
 - 50m wide at the base
 - Gravel infill
 - Rip-rap sides approximately 1m thick
- B) Ramp Abutment and Ramp Construction
 - Ramp abutment will be a short trestle consisting of:
 - i. steel pilings - 1067mm
 - ii. precast concrete pile cap - 1,500(W) mm x 1,200(H) mm x 21,600(L) mm
 - iii. precast concrete box stringers - 3,600(W) mm x 800(H) mm x 7,100(L) mm
 - Ramp 45m in length
- C) Pile Dolphin Installation
 - 3 locations as per the attached drawings
 - Each dolphin will be comprised of 3 steel piles (2 vertical and 1 horizontal)
 - Depth of dolphins range between -4m and -11m chart datum
 - Pile size 1067mm
 - Total of 9 piles

2.2 MATERIALS

The project will require the following materials:

- Gravel – approximately 60,000 m³
- Rip-rap – approximately 8,000 m³
- Steel piles - 24 x 1067mm
- Concrete pile caps - 1,500(W) mm x 1,200(H) mm x 21,600(L) mm
- Concrete box stringers - 3,600(W) mm x 800(H) mm x 7,100(L) mm
- Vehicle ramp

2.3 METHODOLOGY

The existing causeway will be extended using gravel infill and rip-rap sides. Construction will be accomplished using excavators, dump trucks, and other land based equipment.

Steel piles will be positioned by driving rig following the British Columbia Marine and Pile Driving Contractors Association Best Management Practices as outlined in Section 5 – Mitigation Measures. Piles will be driven using vibration if possible and impact only if necessary.

2.4 TIMELINE

The project will commence immediately after the necessary approvals are in place. Ideally construction will begin October 1st, 2012 and be completed by March 15, 2013. A key milestone for the project is to have the causeway extended to deep water before December 2012 to accommodate the delivery of the AltaGas Forrest Kerr generators and stators.

2.5 GENERAL ARRANGEMENT PLAN

A General Arrangement Plan has been prepared (All-Span, 2012) and involves the following drawings dated April 13, 2012:

- Project 12039 Drawing 1 – Key Plan and Site Plans
- Project 12039 Drawing 2 – General Arrangement
- Project 12039 Drawing 4 – Ramp & Barge Plan and Profile
- Project 12039 Drawing 6 – Misc. Details

While these plans are preliminary in nature they are sufficiently detailed to complete this Aquatic Effects Assessment.

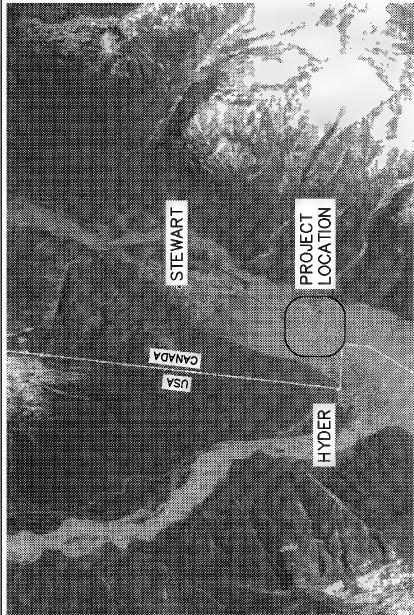
ALL-SPAN
ENGINEERING & CONSTRUCTION LTD.
#207 - 7198 VANIAGO WAY
DELTA, B.C. CANADA V4D 1K7
F: 604-940-5166
E: info@all-span-engineering.com
P: 604-940-2727 FAX: (604) 940-516

CAD FILE: 10039-1

CLIENT
STEWART WORLD PORT
PROJECT
STEWART BARGE RAMP
DRAWING TITLE
KEY PLAN AND SITE PLANS

REV	DESCRIPTION	DATE	BY	DRAWING NO.	PROJECT NO.	DATE
A						
B						
C						
D						
E						
F						
G						
H						
I						
J						
K						
L						
M						
N						
O						
P						
Q						
R						
S						
T						
U						
V						
W						
X						
Y						
Z						

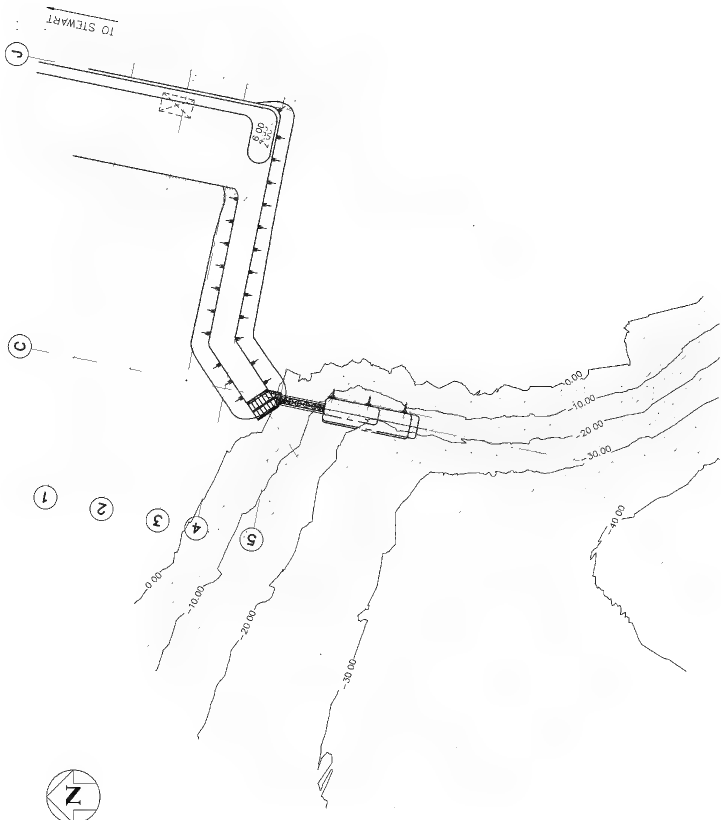
DATE	SCALE	AS NOTED	DATE	SCALE	AS NOTED
3/04/17			3/04/17		
DRAWN BY	J.P.		DRAWN BY	J.P.	
CHECKED BY	D.M.		CHECKED BY	D.M.	
APPROVED			APPROVED		
PROJECT NO.	10039		PROJECT NO.	10039	
DRAWING NO.	1		DRAWING NO.	1	



KEY PLAN
NTS



**PRELIMINARY
FOR DISCUSSION ONLY**



SITE PLAN
1"=200'

All-SPAN
ENGINEERING & CONSTRUCTION LTD.

#207 - 7198 VANIAGO WAY
DELTA, B.C. CANADA V4D 1K7
TEL: 604-940-5166 FAX: 604-940-516

STEWART WORLD PORT
PROJECT
STEWART BARGE RAMP
DRAWING TITLE
GENERAL ARRANGEMENT

DATE	BY	DESCRIPTION	REV.
			A
			B
			C
			D
			E
			F
			G
			H
			I
			J
			K
			L
			M
			N
			O
			P
			Q
			R
			S
			T
			U
			V
			W
			X
			Y
			Z
			AA
			AB
			AC
			AD
			AE
			AF
			AG
			AH
			AI
			AJ
			AK
			AL
			AM
			AN
			AO
			AP
			AQ
			AR
			AS
			AT
			AU
			AV
			AW
			AX
			AY
			AZ
			BA
			BB
			BC
			BD
			BE
			BF
			BG
			BH
			BI
			BJ
			BK
			BL
			BM
			BN
			BO
			BP
			BQ
			BR
			BS
			BT
			BU
			BV
			BW
			BX
			BY
			BZ
			CA
			CB
			CC
			CD
			CE
			CF
			CG
			CH
			CI
			CJ
			CK
			CL
			CM
			CN
			CO
			CP
			CQ
			CR
			CS
			CT
			CU
			CV
			CW
			CX
			CY
			CZ
			DA
			DB
			DC
			DD
			DE
			DF
			DG
			DH
			DI
			DJ
			DK
			DL
			DM
			DN
			DO
			DP
			DQ
			DR
			DS
			DT
			DU
			DV
			DW
			DX
			DY
			DZ
			EA
			EB
			EC
			ED
			EE
			EF
			EG
			EH
			EI
			EJ
			EK
			EL
			EM
			EN
			EO
			EP
			EQ
			ER
			ES
			ET
			EU
			EV
			EW
			EX
			EY
			EZ
			FA
			FB
			FC
			FD
			FE
			FF
			FG
			FH
			FI
			FJ
			FK
			FL
			FM
			FN
			FO
			FP
			FQ
			FR
			FS
			FT
			FU
			FV
			FW
			FX
			FY
			FZ
			GA
			GB
			GC
			GD
			GE
			GF
			GG
			GH
			GI
			GJ
			GK
			GL
			GM
			GN
			GO
			GP
			GQ
			GR
			GS
			GT
			GU
			GV
			GW
			GX
			GY
			GZ
			HA
			HB
			HC
			HD
			HE
			HF
			HG
			HH
			HI
			HJ
			HK
			HL
			HM
			HN
			HO
			HP
			HQ
			HR
			HS
			HT
			HU
			HV
			HW
			HX
			HY
			HZ
			IA
			IB
			IC
			ID
			IE
			IF
			IG
			IH
			II
			IJ
			IK
			IL
			IM
			IN
			IO
			IP
			IQ
			IR
			IS
			IT
			IU
			IV
			IW
			IX
			IY
			IZ
			JA
			JB
			JC
			JD
			JE
			JF
			JG
			JH
			JI
			JJ
			JK
			JL
			JM
			JN
			JO
			JP
			JQ
			JR
			JS
			JT
			JU
			JV
			JW
			JX
			JY
			JZ
			KA
			KB
			KC
			KD
			KE
			KF
			KG
			KH
			KI
			KJ
			KK
			KL
			KM
			KN
			KO
			KP
			KQ
			KR
			KS
			KT
			KU
			KV
			KW
			KX
			KY
			KZ
			LA
			LB
			LC
			LD
			LE
			LF
			LG
			LH
			LI
			LJ
			LK
			LL
			LM
			LN
			LO
			LP
			LQ
			LR
			LS
			LT
			LU
			LV
			LW
			LX
			LY
			LZ
			MA
			MB
			MC
			MD
			ME
			MF
			MG
			MH
			MI
			MJ
			MK
			ML
			MM
			MN
			MO
			MP
			MQ
			MR
			MS
			MT
			MU
			MV
			MW
			MX
			MY
			MZ
			NA
			NB
			NC
			ND
			NE
			NF
			NG
			NH
			NI
			NJ
			NK
			NL
			NM
			NN
			NO
			NP
			NQ
			NR
			NS
			NT
			NU
			NV
			NW
			NX
			NY
			NZ
			OA
			OB
			OC
			OD
			OE
			OF
			OG
			OH
			OI
			OJ
			OK
			OL
			OM
			ON
			OO
			OP
			OQ
			OR
			OS
			OT
			OU
			OV
			OW
			OX
			OY
			OZ
			PA
			PB
			PC
			PD
			PE
			PF
			PG
			PH
			PI
			PJ
			PK
			PL
			PM
			PN
			PO
			PP
			PQ
			PR
			PS
			PT
			PU
			PV
			PW
			PX
			PY
			PZ
			QA
			QB
			QC
			QD
			QE
			QF
			QG
			QH
			QI
			QJ
			QK
			QL
			QM
			QN
			QO
			QP
			QQ
			QR
			QS
			QT
			QU
			QV
			QW
			QX
			QY
			QZ
			RA
			RB
			RC
			RD
			RE
			RF
			RG
			RH
			RI
			RJ
			RK
			RL
			RM
			RN
			RO
			RP
			RQ
			RR
			RS
			RT
			RU
			RV
			RW
			RX
			RY
			RZ
			SA
			SB
			SC
			SD
			SE
			SF
			SG
			SH
			SI
			SJ
			SK
			SL
			SM
			SN
			SO
			SP
			SQ
			SR
			SS
			ST
			SU
			SV
			SW
			SX
			SY
			SZ
			TA
			TB
			TC
			TD
			TE
			TF
			TG
			TH
			TI
			TJ
			TK
			TL
			TM
			TN
			TO
			TP
			TQ
			TR
			TS
			TT
			TU
			TV
			TW
			TX
			TY
			TZ
			UA
			UB
			UC
			UD
			UE

ALL-SPAN

ENGINEERING & CONSTRUCTION LTD.

#207 - 7198 VANIAGO WAY
DELTA, B.C. CANADA V4G 1K7
TEL: 604-940-5166 FAX: 604-940-516

CLIENT

STEWART WORLD PORT

PROJECT

STEWART BARGE RAMP

DRAWING TITLE

RAMP & BARGE PLAN & PROFILE

DATE

3/04/17

SCALE

AS NOTED

UP

DRAWN BY

J.P.

CHECKED BY

D.M.

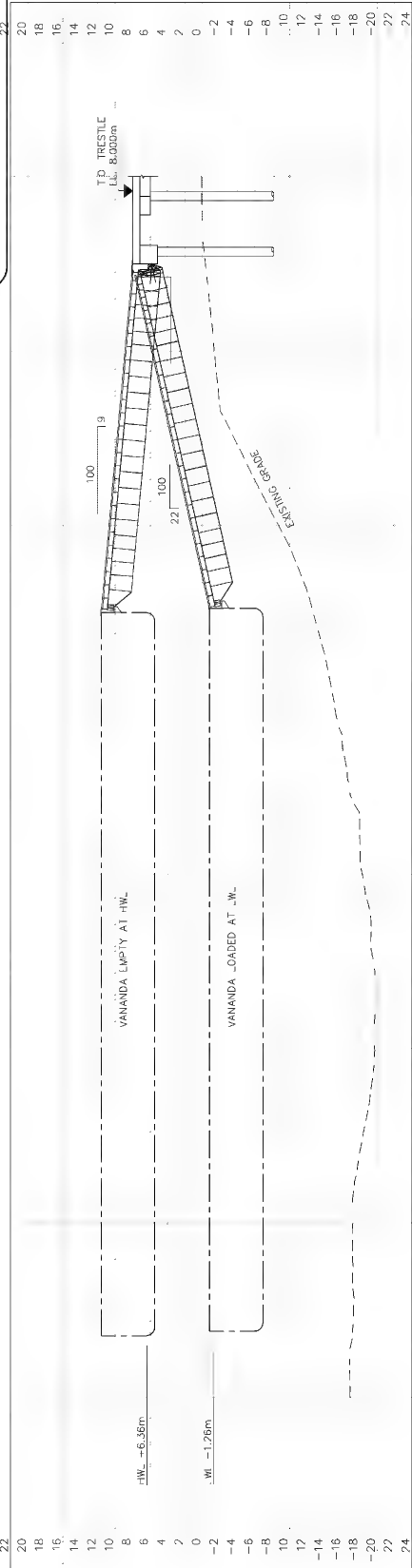
APPROVED

PROJECT NO.

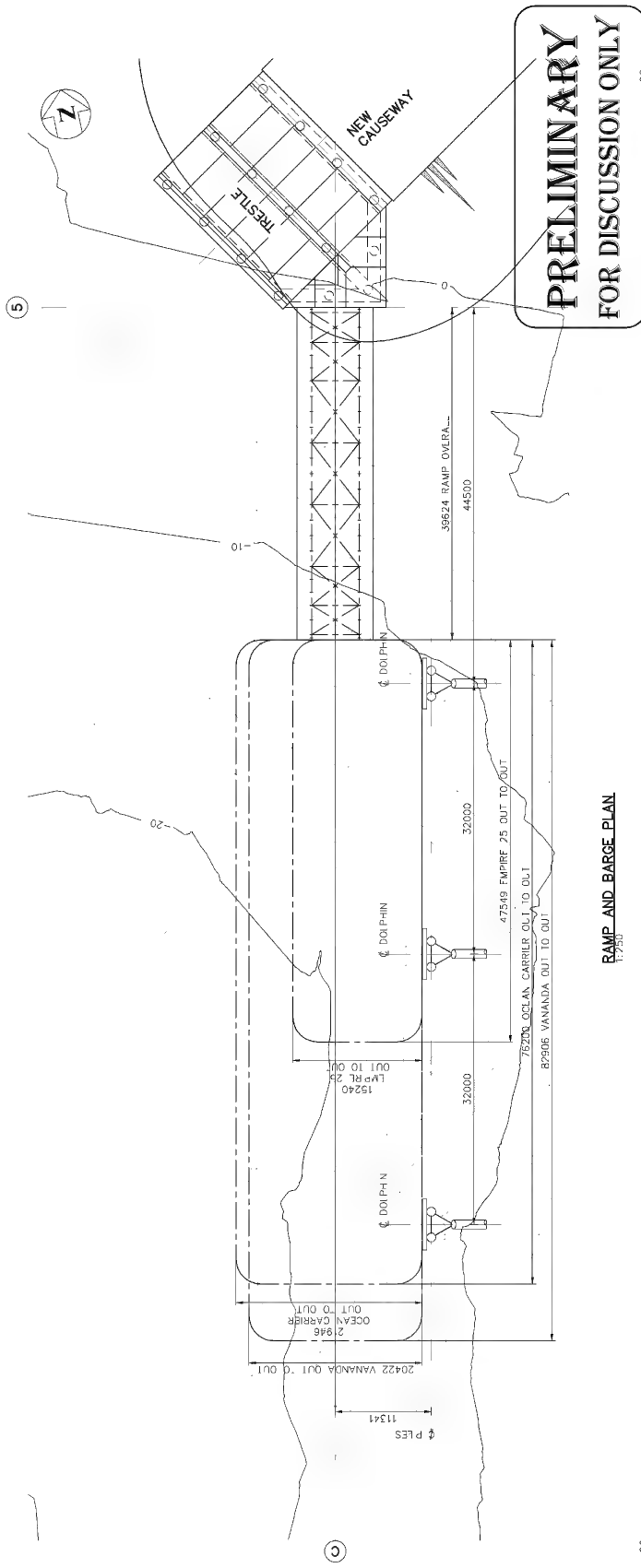
2039

REV

4



PROFILE ALONG GRIDLINE C
1:250



RAMP AND BARGE PLAN
1:250

SECTION 3 – EXISTING CONDITIONS

3.0 GENERAL

On May 1 and 2, 2012 Balanced performed field inspections to collect above and below water biophysical information (Appleton, 2012a). The above water survey was conducted by a team of biologists (Warren Appleton, Duncan Clark, and Kurt Fehr) and included a general survey of the area from above the high water mark to the low tide at the time of survey (2.0m chart datum). Biophysical information and topographical data was collected using a dGPS and a Total Station.

The below water survey was conducted by a team of WorkSafeBC certified SCUBA QEP divers and involved making general observations on species presence and abundance, as well as mapping the transitions between different substrate types relative to local infrastructure. A hydrographic survey using a Digital Depth Sounder and dGPS was also performed.

Biophysical, bathymetric, and topographic information collected during the field visits are available on the attached Balanced Drawings 5397-D-01.1 (Location Map), 5397-D-02.1 (Biophysical Conditions), and the attached File No. 5397-E-01.1 (Table 1 – Observed Biota) and are summarized below. All elevations are in metres and related to chart datum via the Stewart Harmonic Station (CHS) using Tides and Currents Pro v. 3.5.107.

3.1 PHYSICAL CONDITIONS

The existing causeway is a disturbed site primarily consisting of gravel and deteriorating asphalt with some areas of shallow soil within the vicinity of the tank farm containment area at the north end of the survey area. The edge of the causeway consists of a riprap armoured slope with angular rock ranging from 64mm to 700mm in diameter, with the majority of rock being less than 300mm in diameter. The riprap slope runs from the top of bank (7.4 to 7.8 m chart datum) to an elevation of 3.0m chart datum. At the toe of the riprap slope the substrate transitions to mud with sparse woody debris on the west side of the causeway and to primarily pebble substrate with patches of sand and cobble on the south side of the causeway. The mud substrate extends south to an approximate elevation of 1.0m chart datum where it transitions to pebble, which continues to subtidal depths. A short riprap berm separates a boat launch ramp from the neighbouring Bear River.

3.2 BIOLOGICAL CONDITIONS

All species observed during the biophysical survey are presented in Table 1 – Species List (file number 5397-E-01.2 dated July 11, 2012).

The majority of upland asphalt and gravel habitat was devoid of any vegetation. A narrow 1 to 2 metre fringe of vegetation was present along the top of the riprap slope which consisted of grasses and sparse willow (*Salix sp.*) and Sitka alder (*Alnus crispa ssp. sinuata*) shrubs. A greater variety of vegetation was present at the north end of the survey area within the vicinity of the tank farm containment area, including some trees (cottonwood, hemlock, and Sitka spruce). Dunegrass (*Elymus mollis*) and tufted hairgrass (*Deschampsia cespitosa*) were patchily distributed amongst the riprap at the northwest end of the survey area. Aquatic vegetation was limited to rockweed (*Fucus sp.*) and green alga (*Ulva intestinalis*) which was most abundant on the riprap substrate. Colonial diatoms and green alga were also observed at less than 25% coverage on intertidal pebble. Observed invertebrate species included tanner crabs (*Chionoecetes bairdi*) on subtidal

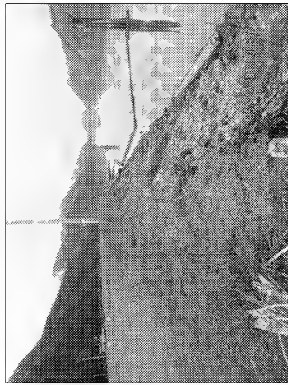


Photo 1. A narrow fringe of grasses and shrubs was present along the top of the causeway's riprap slope.



Photo 2. Green algae and rockweed were common on the riprap east of the Bear River.

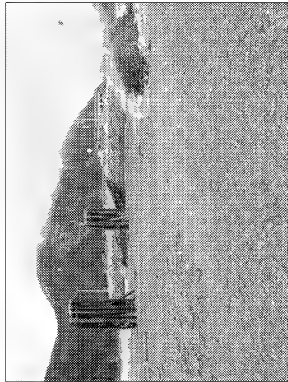


Photo 3. View of riprap slope, berm, and pebble intertidal zone south of the causeway and boat launch.

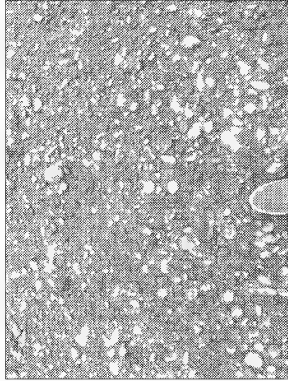


Photo 4. Close-up of intertidal pebble with less than 25% coverage of green algae and diatoms.

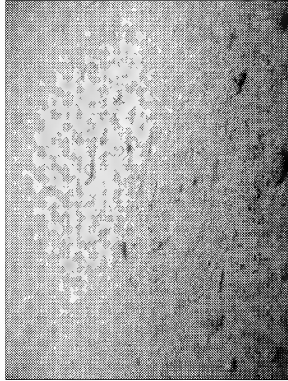


Photo 5. Close-up of intertidal mud substrate.

- LEGEND**
- Existing Structures
 - 1.0m Contour
 - 5.0m Contour
 - Low Water (LWL) (0m Chart Datum)
 - High Water (HWL) (7.67m Contour)
 - Riprap (Angular Rock >64mmØ)
 - Pebble (2mm to 64mmØ)
 - Mud (<0.0625mmØ)
 - Cobble (64mm to 255mmØ)
 - Sand (0.0625mm to 2mmØ)
 - Woody Debris
 - Photo
 - Crabs
 - Diatoms
 - Dunegrass
 - Barnacles
 - Grasses & Shrubs
 - Green Algae
 - Marsh Plants
 - Rockweed
 - Reference Point



Photo 6. Barnacle spat and diatoms were observed on cobble substrate near the low water line. Pebble substrate was typically bare.



Photo 7. Tanner crab on subtidal pebble substrate with silty sand.

DRAWING NOTES

- For a complete list of drawing notes, see Drawing 5397-D-01.1 - Location Map.
- Intertidal biophysical information was collected using a total station or dGPS.
- General underwater biophysical information was collected by making a series of dives throughout the survey area. Observations were located relative to existing structures onsite.
- The information, including elevation and biophysical data, presented on the drawings may vary from current conditions due to the passage of time or seasonal changes in substrate and biota.
- The data presented on the drawings represents, in general terms, the substrate and biota types.

Ref. No.	REFERENCE	Client	Author	<div>ARCTIC CONSTRUCTION 11421 Alaska Road Fort St. John, BC V1J 6N2</div>	<div>BALANCED ENVIRONMENTAL</div>	PROJECT		
						Checked by	WA	BIOPHYSICAL CONDITIONS BARGE RAMP RELOCATION PROJECT, STEWART, BRITISH COLUMBIA
						Drawn by	DC	
						Date	J.Jy 11, 2012	
						Scale	1:2900	
						Inspectors	WAKF,DC	
						Paper	11 x 17	
						DWG. No.	5397-D-02.2	

TABLE 1

OBSERVED BIOTA
BARGE RAMP RELOCATION PROJECT
STEWART, BRITISH COLUMBIA

Date of survey: May 1 and 2, 2012

Common Name	Scientific Name	Chart Datum Range (m)		Abundance*	
		Upper	Lower	Description	Method
Barnacles					
Acorn	<i>Balanus glandula</i>	1.0	<-20.0	Common	PAC
Brown Alga					
Rockweed	<i>Fucus gardneri</i>	4.4	2.3	Common	PAC
Crabs					
Tanner	<i>Chionoecetes bairdi</i>	1.0	<-20.0	Sparse	IOT
Diatoms					
Colonial	<i>Class: Bacillariophyceae</i>	2.5	0.0	Sparse	PAC
Green Alga					
Green String Lettuce	<i>Ulva intestinalis</i>	5.0	2.0	Few	PAC
Marsh Plants					
Dunegrass	<i>Elymus mollis</i>	7.5	6.0	Rare	PAC
Seaside Plantain	<i>Plantago maritima</i>	4.4	4.4	Rare	PAC
Tufted Hairgrass	<i>Deschampsia cespitosa</i>	6.0	4.4	Rare	PAC
Riparian Plants					
Black Cottonwood	<i>P. balsamifera ssp. trichocarpa</i>	>7.5	>7.5	Rare	PAC
Blueberry	<i>Vaccinium sp.</i>	>7.5	>7.5	Rare	PAC
Grass	<i>Various spp.</i>	>7.5	>7.5	Sparse	PAC
Salal	<i>Gaultheria shallon</i>	>7.5	>7.5	Rare	PAC
Scouring-rush	<i>Equisetum hyemale</i>	>7.5	>7.5	Rare	PAC
Sitka Alder	<i>A. crispa ssp. sinuata</i>	>7.5	>7.5	Sparse	PAC
Sitka Spruce	<i>Picea sitchensis</i>	>7.5	>7.5	Rare	PAC
Western Hemlock	<i>Tsuga heterophylla</i>	>7.5	>7.5	Rare	PAC
Willow	<i>Salix sp.</i>	>7.5	>7.5	Sparse	PAC
Thimbleberry	<i>Rubus parviflorus</i>	>7.5	>7.5	Rare	PAC

*PAC = Percent Aerial Coverage, IOT = Individuals on Transects

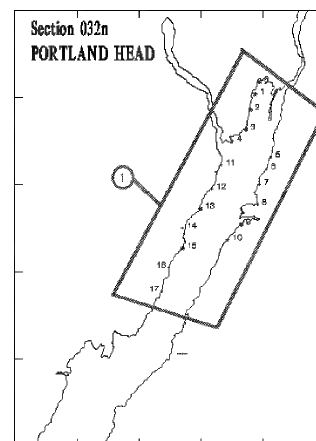
*Abundance Category	Percent Aerial Coverage (PAC)	Individuals on Transects or Tracklines (IOT)	Individuals per Square Metre (IPM)
Rare	<5%	1	1
Sparse	5-25%	2-4	2-4
Few	26-50%	5-10	5-10
Common	51-75%	11-30	11-30
Abundant	>75%	>30	>30

pebble and unidentified shrimp within the intertidal mud habitat. No critical habitat organisms were visible such as eelgrass (*Zostera marina*), kelp (*Laminarians*), pickleweed (*Salicornia spp.*) or sedges (*Carex spp.*). Overall, colonization by visible organisms was sparse.

3.3 FISH PRESENCE AND USAGE

A review of the online Fish Information Summary System database on June 7, 2012 (MOE, 2012 - Appendix 3) stated that the following fish have been observed in the Bear River: Dolly Varden, steelhead, sculpins, Chinook salmon, chum salmon, coho salmon, sockeye salmon, pink salmon, lamprey, longnose dace, mountain whitefish, rainbow trout, and chub. However, local knowledge suggests that the area is primarily coho habitat (Hottot, 2012).

There are existing records that demonstrate that herring spawn near the site (DFO, 2012a - right). Eulachon are present in the Bear River and have been observed near the mouth of the Portland Canal. They only enter freshwater sites for spawning which occurs in the area between February and March prior to the spring freshet; (DFO, 2012b; Francis, 2012; Hay & McCarter, 2000).



No finfish were observed during the biophysical survey (Appleton, 2012a). Visibility during the biophysical survey varied from 0.3m above the low water mark to 3 metres below the low water mark.

3.4 SPECIES AT RISK AND MARINE MAMMALS

On September 5, 2012, both Fisheries and Oceans Canada and Environment Canada were contacted to determine if they were aware of any marine Species at Risk at the site and had any concerns. The following species were identified as potentially being at the site in an email received from DFO on September 17, 2012:

Northern Abalone (*Haliotis kamtschatkana*)

The location of the project does not fall within the critical habitat for northern abalone (SARA, 2012). Furthermore abalone habitat is defined as bedrock and/or boulder substrate with little or no gravel, sand, mud or shell hash present, and with normal marine salinity and good water exchange (Lessard & Campbell, 2007). The existing substrate at the site and low salinity conditions of the estuarine environment make the site generally unsuitable for abalone habitat. The initial biophysical survey revealed that suitable abalone habitat is not present within the project footprint.

Eulachon (*Thaleichthys pacificus*)

The Bear River was assessed as threatened habitat by COSEWIC in May 2011, but is currently being reassessed (Francis, 2012). Very little is known about eulachon in the Bear River; as an anadromous fish, they return from marine to freshwater to reproduce in the early spring; sexually mature fish begin their migration in late summer and fall and spawning occurs in the Nass and Skeena rivers between late February and early March (DFO, 2012b; Hay & McCarter, 2000). Mitigation measures that may be employed are detailed in Section 5.4.

Marine Mammals

There are various marine mammals that might be encountered in the area, harbour seals (*Phoca vitulina*), killer whales (*Orcinus orca*), Steller's sea lions (*Eumetopias jubatus*), harbour porpoise (*Phocoena phocoena*), Pacific white-sided dolphin (*Lagenorhynchus obliquidens*) and river otters (*Lutra canadensis*) are the most likely mammals to be encountered as they are year-round residents and are known to use estuarine environments.

Only Killer Whales, Steller's Sea Lions, and Harbour Porpoises are established Species at Risk. Grey (*Eschrichtius robustus*) and humpback whales (*Megaptera novaeangliae*) are found in the region and are known to inhabit estuaries, however, during the winter they migrate south to warmer waters, and will therefore not be in the area during the project works. The Sea Otter (*Enhydra lutris*) is a protected species, however, they have a very limited distribution and are not known to be near the project site, furthermore their preferred habitat is not found within the project footprint.

Most of these species are typically observed in waters much deeper than the project footprint and are primarily found in open water. None of these species were observed during the onsite biophysical survey (Appleton, 2012a) and are not expected to be at the site during construction. Monitoring and mitigation measures are detailed in section 7.

SECTION 4 – IMPACTS

4.0 GENERAL

The proposed relocation of the barge ramp is shown on All-Span's Drawing #12039-2 General Arrangement. The existing barge ramp location has become filled in with aggregate from the Bear River and cannot be used. The proposed new location will allow barges to offload at all tide levels without grounding on the foreshore. The impacts to fish and fish habitat from this work relate to the net loss of intertidal substrate and water column from the proposed fill area.

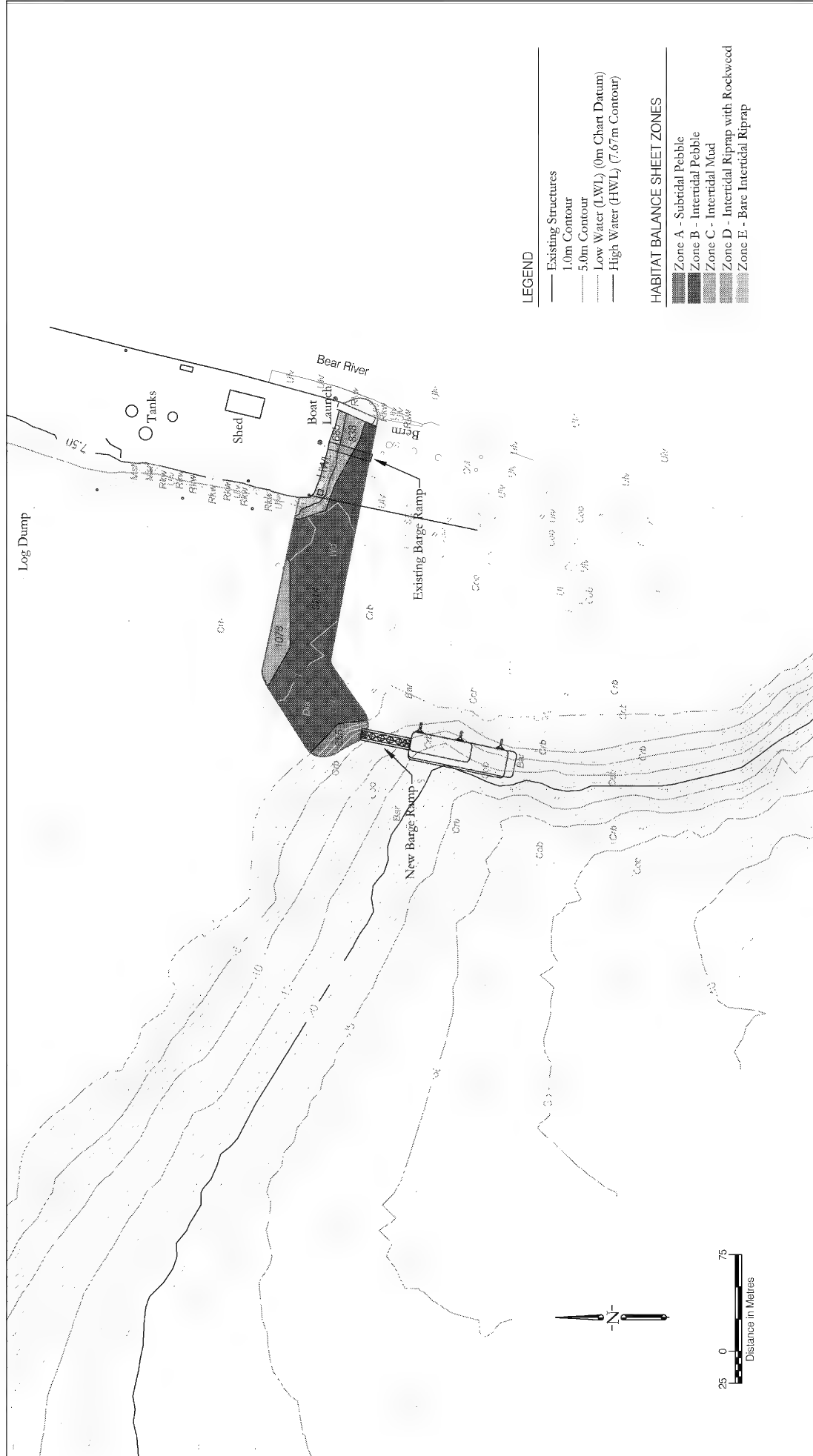
The proposed fill area has a footprint of approximately 12,517m² of which 5,596 m² will be raised above the high water mark (7.6m chart datum). The fill area will cover an existing riprap slope, of which approximately 50% (on the lower half) is inhabited by Rockweed and the remaining upper 50% being bare. Offshore of the riprap, in the site formally used for barge loading/unloading, half of the area is primarily a pebble substrate with patches of sand and cobble. This area is mostly devoid of biota with less than 25% coverage by diatoms (*Bacillariophyceae*). To the east, the substrate under the proposed fill area transitions to mud at the boundary with the active booming ground. Mud substrate cover represents less than 10% of the proposed fill area. This area is currently covered by log booms that ground out during periods of low tide and is devoid of any visible organisms. According to a local, the area has been reworked by logging operations and should have an underlying layer of pebbles. Small amounts of woody debris are present.

Post construction, the causeway will have a riprap slope surrounding the facility. The riprap area within the growing range of rockweed (2.3m to 4.4m) is expected to be over 3 times as large as that of the existing causeway that supports rockweed. The fill area is expected to result in a loss of water column of approximately 70,000 m³. A complete description of the fill area impacts are described below in the Habitat Balance Sheet (Table 2) and are shown on Balanced Drawing 5397-D-07.2.

Table 2. Habitat Balance Sheet (Areas Below the High Water Mark)

Zones	Location	Elevation	Substrate	Indicator Species	Area Before (m ²)	Area After (m ²)	Net Area (m ²)
A	Booming Grounds	Subtidal	Pebble	Crabs	655	0	-655
B	Old Ramp Area	Intertidal	Pebble	Diatoms	9,214	0	-9,214
C	Booming Grounds	Intertidal	Mud	None Visible	1,078	0	-1,078
D	Causeway	Intertidal	Riprap	Rockweed	864	3,810	2,946
E	Causeway	Intertidal	Riprap	None Visible	706	3,111	2,405
Total					12,517	6,921	-5,596

The barge ramp encompasses an area of approximately 337 m². There are no photosynthetic organisms within the footprint of these structures. The substrate is entirely subtidal and consists of pebble.



Ref. No.	REFERENCE	Client	ARCTIC CONSTRUCTION 11421 Alaska Road Fort St. John, BC V1J 6N2	Author	PROJECT			
					Checked by	X/IE	PROJECT IMPACT DRAWING	
					Drawn by	WA	BARGE RAMP RELOCATION PROJECT,	
					Date	Oct. 25, 2012	STEWART, BRITISH COLUMBIA	
					Scale	As Shown		
DWG. No.	5397-D-07.2	Inspector	WA KF/DC	Paper	11 x 17			

SECTION 5 – MITIGATION MEASURES

5.0 GENERAL

The proposed works have incorporated mitigation measures throughout all design and construction stages of the project to ensure that fish, fish habitat and species at risk are protected. A more detailed description of mitigation measures is provided below.

5.1 PROJECT DESIGN

The project has undergone several stages of environmental design to mitigate potential impacts to the environment. These have included the following:

- moving the causeway west to reduce the project footprint and avoid filling portions of the Bear River,
- reducing the project footprint from 30,000 m² to 19,500 m² by choosing a more efficient route to deep water and minimizing the causeway width, and,
- a further in project footprint from 19,500 m² to 12,470 m² by reducing on-site storage to a minimum.

5.2 CONSTRUCTION OF CAUSEWAY

During construction the following procedures will mitigate several impacts:

- infill will be placed during periods of low tide,
- contractor to have spill management plan in place, including spill kit,
- the Contractor shall inspect equipment to ensure it is in good working order, clean and free of leaks,
- heavy equipment to be kept out of the water,
- heavy equipment to operate within the project footprint only,
- any storage areas will be covered, and,
- minimize fill placement during extreme rainfall events.

5.3 CONSTRUCTION OF PILE STRUCTURES

Impacts related to pile driving will be mitigated by:

- following Best Management Practices for Pile Driving (PDA, 2003 – Appendix 5),
- using a vibratory hammer if driving conditions permit,
- employing a bubble curtain if required,
- capping pile tops to prevent wildlife entrapment, and,
- preventing grounding of barges or equipment on the foreshore.

5.4 IMPACTS TO FISH

Mitigation measures will be employed as deemed necessary by the environmental monitor depending on the presence of fish, phase or type of work, and potential impacts to fish habitat. These decisions will be made on site; mitigation strategies may include, but are not limited to, placement of silt curtains, bubble curtains or stoppage of work. Additional mitigation measures may be required should eulachon be observed on site during construction.

SECTION 6 – COMPENSATION PLAN

6.0 GENERAL

Projects that involve placement of fill into the marine environment typically are required to provide habitat compensation that supports the affected fish stocks. DFO's preference is typically for construction of "like for like" habitat at the site. If this is not feasible, alternative forms of compensation such as offsite enhancements or alternate forms of compensation may be considered.

DFO has specifically stated that a habitat compensation plan must be provided (Koroluk, 2012a - Appendix 1) and that the use of salt marsh as compensation would have benefit (Koroluk, 2012b – Appendix 1). The section below describes the proposed habitat compensation for the project.

6.1 TARGET SPECIES

High mortality rates of juvenile salmon are observed in estuaries due to several factors, such as food supply, predation and pollution. Species such as coho can spend up to a year before travelling out to sea. During their time in the estuary, they undergo physical adaptations to salt water and feed upon small plankton and insects which can be found along the shoreline - in soils, brackish marsh communities, large woody debris, or falling from riparian vegetation.

6.2 ENHANCEMENT OPTIONS

One possible method for improving coho habitat is to construct additional salt marsh habitat. A large number of species prey on juvenile salmon and salt marshes offer canopy to hide from predators when inundated by tidal waters (Appleton, 2012b). Salt marshes produce detritus, which provides food for bacteria, protozoans, small invertebrates, and clams, which are in turn eaten by larger invertebrates, fish, birds and mammals (Appleton, 2012b). They also have an abundance of insects, which are an important food source for many species including juvenile coho (Appleton, 2012b).

6.3 PROPOSED COMPENSATION

The proposed habitat enhancement involves constructing a habitat bench, which will provide an additional 1,865m² area of salt marsh habitat as shown on Balanced Drawings 5397-D-08.2 and 5397-09.1. The work involves the placement of fill in areas of currently devoid of aquatic vegetation. Fill placement is designed to raise the elevation to match elevations of productive marsh habitats in adjacent areas. Construction of the salt marsh bench will include:

- removing sediments from within the footprint of the salt marsh bench using a backhoe and stockpiling them for later use,
- fill will be removed via backhoe and gravel truck from the Bear River under the District of Stewart license of occupation and reclamation permit. Material will be transported to the construction area using a gravel truck and will be placed using a back hoe to achieve the target elevation. Final levelling will be completed with a dozer,
- an impermeable layer will be placed on top of the fill (filter fabric or equivalent),
- previously stockpiled native sediments will be placed as a 0.6m capping layer using a backhoe or dozer,
- a slope stabilization berm will be constructed to protect and contain the fill and sediment layers,

-
- the surface of the marsh bench will be sloped to ensure proper drainage and the target marsh elevation will be confirmed with a laser level under the supervision of a qualified biologist to an accuracy of +/- 1cm, and,
 - following the construction of the marsh bench, transplanting will be conducted by labourers under the guidance of a qualified biologist to ensure a minimum density of 1 salt marsh plug per square metre.

Additional construction details are available on the attached Balanced Drawings -D-08.2 and 5397-09.1 and a detailed cost estimate is provided in Appendix 6.

6.4 ADDED VALUE ENHANCEMENTS

The project will provide wave protection to 60,000 m² of estuary which will improve growing conditions for marsh plants and provide calm waters for juvenile salmon. The side slopes of the causeway that remain riprap will provide at least 1,500 m² of rockweed habitat in the mid intertidal zone.

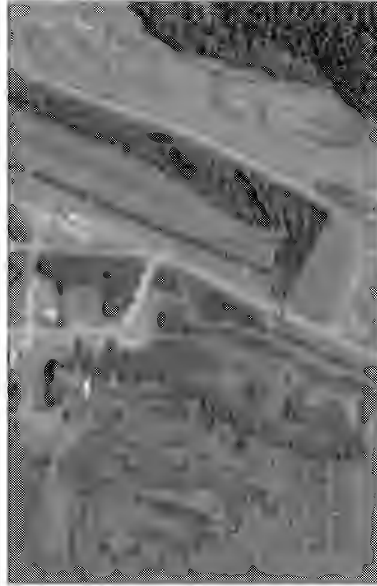


Photo 1. Aerial photo showing location of Saltmarsh Compensation south of 1st Ave. in Stewart, British Columbia.

LEGEND

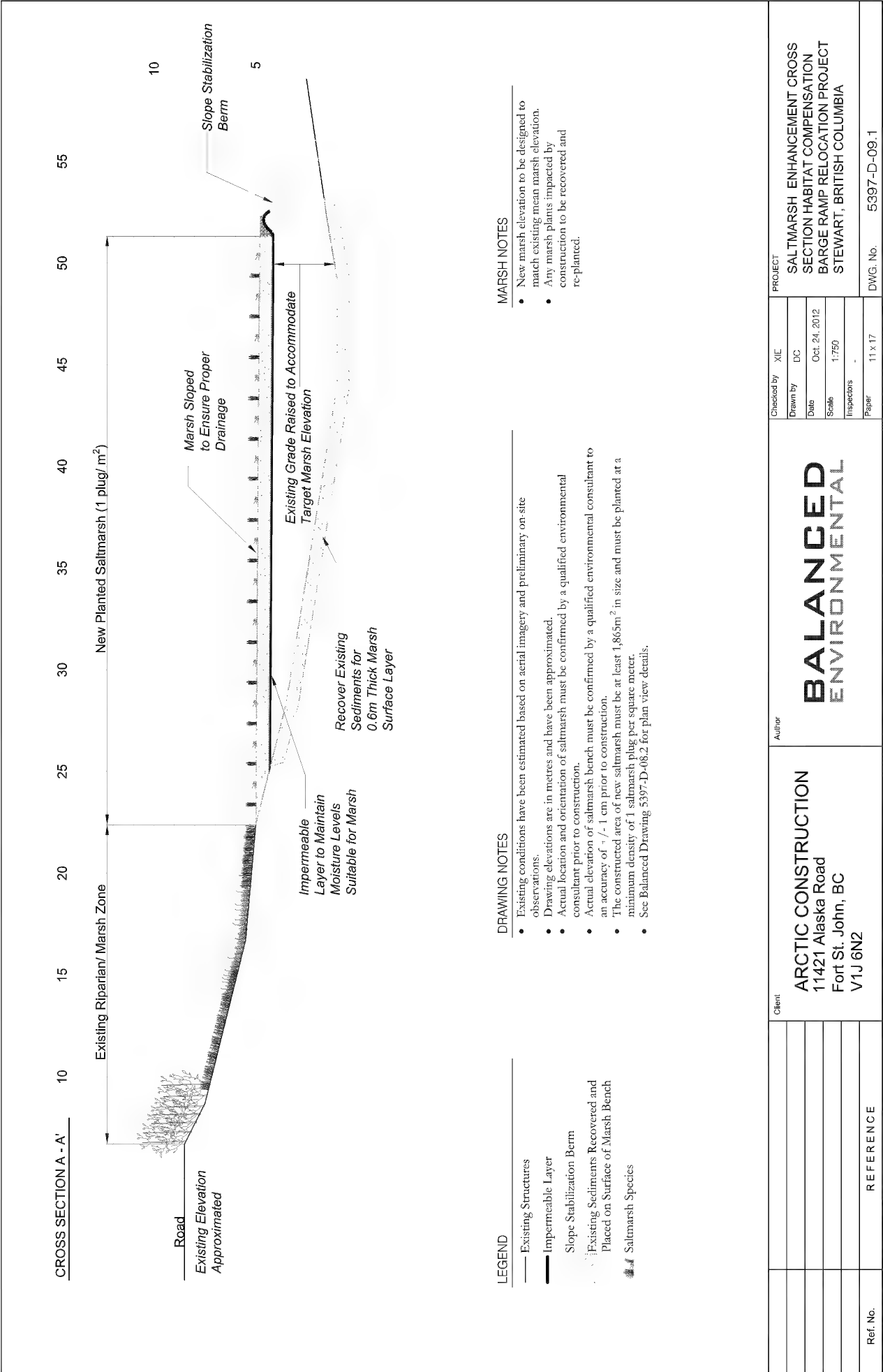
- Existing Structures
- Approximate Centerline of Road
- - - - - Cross Section A-A'
- New Marsh Containment Berm
- New Planted Saltmarsh Habitat

DRAWING NOTES

- Existing conditions have been estimated based on aerial imagery and preliminary on-site observations.
- Actual location and orientation of saltmarsh must be confirmed by a qualified environmental consultant prior to construction.
- Actual elevation of saltmarsh bench must be confirmed by a qualified environmental consultant to an accuracy of ± 1 cm prior to construction.
- The constructed area of new saltmarsh must be at least $1,865\text{m}^2$ in size and must be planted at a minimum density of 1 saltmarsh plug per square meter.
- See Balanced Drawing 5397-D-09.1
- Typical Marsh Cross Section for Details.



Client	ARCTIC CONSTRUCTION		Author	BALANCED ENVIRONMENTAL		Checked by XIE	PROJECT	
	11421 Alaska Road						SALTMARSH ENHANCEMENT PLANVIEW	
	Fort St. John, BC						HABITAT COMPENSATION	
	V1J 6N2						BARGE RAMP RELOCATION PROJECT	
Ref. No.	REFERENCE		Inspectors	DWG. No. 5397-D-08.2		Date	STEWART, BRITISH COLUMBIA	



SECTION 7 – MONITORING PLAN

7.0 GENERAL

A monitoring plan is typically required to ensure that the project is executed as per any regulatory requirements as it moves through its' various phases including site preparation, construction, project completion and post construction. The following section describes the proposed monitoring plan for the project.

7.1 SITE PREPARATION

An environmental monitor, acceptable to DFO, shall have a pre-construction meeting with the project crews prior to performing any works within 15 metres above the high water mark or any intertidal or subtidal works. The environmental monitor shall review with the onsite crews the environmental practices, expectations and requirements of the project and answer any questions.

7.2 CONSTRUCTION OF CAUSEWAY AND HABITAT COMPENSATION

An environmental monitor shall be onsite during construction activities when there is potential for serious adverse effects to fish or fish habitat. The environmental monitor shall be onsite for a minimum of 1 full day for each type of work activity. The environmental monitor shall remain onsite until the contractor has demonstrated that work activities are being performed in compliance with regulatory requirements. Monitoring reports, field notes, photographs and records shall be collected and kept on file.

7.3 CONSTRUCTION OF PILE STRUCTURES

Monitoring of pile driving activities will only be performed if the use of an impact hammer is required. The acceptable threshold for pressure waves is 30 kPa and is commonly observed when driving steel piling of 600mm inch diameter or larger. Currently, piles are to be installed with a vibratory hammer. Previous project experience has demonstrated that vibratory hammer activities typically generate pressure waves under 5 kPa.

If impact hammering is required, the environmental monitor shall be present to monitor pressure waves at various depths at a safe distance from the pile. If pressure waves exceed 30 kPa, the monitor shall stop works and require the contractor to install systems or processes to mitigate the pressure wave energy. The monitor shall remain onsite until convinced that the works are properly mitigated. Monitoring records shall be documented and kept on file.

7.4 SPECIES AT RISK AND MARINE MAMMAL MONITORING

To ensure that no marine mammals are endangered during the project phase a monitor will be on site to check for the presence of species at risk and marine mammals during the initial stages of the project. A member of the construction crew will be trained by the environmental monitor (EM) to identify species and make observations and report all sightings to the EM as they happen.

A 1km buffer zone will be established around the project site, if any cetaceans are observed within 1km during pile driving, work will be stopped until 30 minutes after they have left the safety zone. A 500m safety zone around the project site will be established for all other marine mammals, within which their behaviour will be observed and reported to the EM immediately. If the animal is deemed to be at risk or in distress, works will be stopped until the animal is considered no longer at risk or has left the buffer zone.

7.5 PROJECT COMPLETION

Within 60 days of completion of all components of the project construction, a post-construction monitoring report will be prepared for DFO and the Proponent. The purpose of the report will be to demonstrate that the works have been constructed as required by any environmental approvals in place such as a *Fisheries Act* Authorization. It is expected that the report will include:

- as-built drawings showing the footprint of all structures constructed,
- a post-construction habitat balance sheet of actual areas constructed,
- a summary of work activities performed and timeline,
- a description comparing the actual habitat balance sheet to the approved habitat balance sheet with rationale for any alterations or discrepancies,
- a summary of mitigation measures used and their effectiveness through the use of qualitative monitoring results such as pressure wave monitoring and water quality,
- details on any emergencies that may have occurred and how they were handled, and,
- a summary of any species at risk observed and any actions required.

7.6 POST CONSTRUCTION MONITORING

Biophysical assessment of the compensatory fish habitat shall be performed at two years and five years following construction. The assessments will be conducted by a qualified marine biological consultant who will submit a report to DFO on or before September 30th in each year that the monitoring assessments are conducted. The assessments will compare remediation of the compensatory habitats with pre-construction conditions and similar habitats within the Bear River Estuary in order to determine if the compensation is functioning as intended. The monitoring assessments will include, but will not be limited to:

- defining the species and aerial coverage by any transplanted or self-propagating vegetation (backshore, intertidal and subtidal vegetation will be documented in the survey),
- a species list of observed marine invertebrates and fish will be compiled and an estimate of numbers of individuals will be recorded,
- a minimum of 1,865 m² of new salt marsh habitat shall be achieved, and,
- an assessment of habitat areas to determine if plug size, density or percent aerial coverage is increasing over time and are the compensation areas becoming comparable to conditions found at similar reference sites within the estuary.

Based on the results of the assessment, a statement with respect to the productive capacity of the restored/created fish habitat should be included in the annual monitoring report.

If the assessment determines that the fish habitats are being successfully restored and protected, the goal of 'No Net Loss' will have been achieved. If macro vegetation and invertebrate numbers within the estuary have not reached the coverage and density levels found in adjacent similar habitats in the estuary within five years, additional monitoring may be required and extended up to ten years post-construction.

If at the end of the monitoring period it becomes evident that the site is not functioning as intended, the proponent may need to provide additional compensation to replace the productive capacity of lost habitats. It is expected that appropriate additional replacement habitat will be negotiated by the proponent with the assistance of a qualified marine biological consultant and DFO.

REFERENCES

- All-Span, 2012. Stewart Barge Ramp. All-Span Engineering and Construction Ltd., 4 pages.
- Appleton, 2012a. Biophysical Survey Results for Barge Ramp Relocation Project, Stewart, British Columbia. Balanced Environmental Services Inc., 7 pages.
- Appleton, 2012b. Stewart Marsh Photos. Balanced Environmental Services. Email dated October 1, 2012, 1 page.
- Byng, 2012. Northwest Port Development. B.C. Ministry of Transportation and Infrastructure (204277), 1 page.
- DFO, 2012a. Herring Spawning Records – Section 32: Pool 1. www.pac.dfo-mpo.gc.ca, accessed Aug. 28, 2012.
- DFO, 2012b. B.C. and Yukon Marine/Estuarine Timing Windows. www.pac.dfo-mpo.gc.ca, accessed Sept. 17, 2012
- Durant, 2012. Stewart World Port. District of Stewart, letter to DFO June 5, 2012, 1 page.
- Francis, 2012. RE: Marine Species at Risk in Stewart, BC. Fisheries and Oceans Canada - Fisheries Management Branch, 1 page.
- Hay & McCarter, 2000. Status of Eulachon *Thaleichthys pacificus* in Canada. Canadian Stock Assessment Secretariat (2000-145), 92 pages.
- Hottot, 2012. Juvenile Coho Primarily Use Bear River Estuary. Personal communication with Warren Appleton in Stewart, May 1st 2012.
- Koroluk, 2012a. Proposal Likely to Result in Impacts to Fish and Fish Habitat. DFO Authorization Required. Fisheries and Oceans Canada, 2 pages.
- Koroluk, 2012b. Re: Stewart Marsh Photos. Fisheries and Oceans Canada. Email dated October 10, 2012, 1 page.
- Lessaerd & Campbell, 2007. Impact Assessment Protocol for Works and Development Potentially Affecting Abalone and Their Habitat. SARA, 18 pages.
- MOE, 2012. Ministry of Environment – Fish Inventory Data Queries. www.a100.gov.bc.ca, accessed June 7, 2012.
- Moffat, 2012. Project Justification. Personal communication with Warren Appleton, Sept. 14, 2012.
- PDA, 2003. Best Management Practices for Pile Driving and Related Operations. B.C. Marine and Pile Driving Contractors Association (PDA), 9 Pages.
- Pimm, 2012. Arctic Construction Ltd. – Ted Pickell, CEO. Province of British Columbia Legislative Assembly, letter dated May 30, 2012, 1 page.
- SARA, 2012. Action Plan for the Northern Abalone (*Haliotis kamtschatkana*) in Canada. www.registerelep-sararegistry.gc.ca, accessed Sept. 17, 2012.
- Wyprsky, 2012. Letter of Support. Chieftain Metals Inc., letter to DFO July 25, 2012.

APPENDIX 1 – DFO CORRESPONDENCE

Warren Appleton

From: Warren Appleton
Sent: July-11-12 5:50 PM
To: 'Chow, Darren'
Cc: 'bmoффat@stewartworldport.com'; Scott Christie
Subject: Stewart Barge Ramp Project
Attachments: 5397-R-02.1 Stewart Barge Ramp.pdf

Darren,

As per my voicemail, the Stewart Project has been revised so that it does not trigger the Comprehensive Study List Regulation associated with the Canadian Environmental Assessment Act. Specifically, the proponent is applying for Authorization for the installation of only a barge ramp at this time. The DFO application form, drawings and habitat balance sheet have all been adjusted to reflect the work required to reactive the existing barge ramp (attached).

We understand that there have been recent political changes to various acts and regulations (Fisheries Act, etc.). However, my understanding from the proponent is that there is considerable pressure and political support for this project to move forward by this fall.

Please give me a call at your earliest convenience to that we may discuss how to move forward with this project.

Regards,

Warren Appleton, RPBio

Project Biologist,
Balanced Environmental Services Inc.
118 Garden Ave., North Vancouver, B.C. V7P 3H2
Phone. 604.988.3033 | Fax. 604.988.3026 | www.balanced.ca

This e-mail and any attachments are considered confidential and privileged information. If you are not the intended recipient please notify the sender immediately by return e-mail, delete this e-mail and destroy any copies. The information provided is intended for the recipient only and shall not be referenced, forwarded, printed, posted, or otherwise used without the expressed written consent of Balanced Environmental.

Duncan

From: Warren Appleton
Sent: October 23, 2012 10:11 AM
To: Duncan
Subject: Fwd: Stewart Marsh Photos

Begin forwarded message:

From: "Koroluk, Bradley" <Bradley.Koroluk@dfo-mpo.gc.ca>
Date: 10 October, 2012 1:26:29 PM PDT
To: Warren Appleton <warren@balanced.ca>, Brad Moffat <bmoffat@stewartworldport.com>
Subject: RE: Stewart Marsh Photos

Hi gents,

I am expecting that the logistical issues surrounding the Airport Creek restoration project may be too much to be used as compensation for your project.

I appreciate Warren's rationale email below for the use of a salt marsh, there is no doubt it would have benefit. I spoke with Joy Hillier (Section Head) and keeping the project's time constraints associated in mind, while still providing good compensation opportunities DFO will accept salt marsh at a rate of 3:1 compensation for the total impacted area footprint below the HWM.

We will eventually need drawings, locations, planting and marsh creation plans, as well as a monitoring program. I know Warren is aware of what to provide. We also will use a cost estimate for the compensation project as a base for the Letter of Credit which we will hold as part of the Authorization; Brad have I mentioned that yet? If not let me know and I can provide a more detailed letter of information. First off we would need confirmation that the compensation option is acceptable to everyone and that there is enough 'barren' area to construct the compensation habitat.

If this works for you Brad please confirm. If you have any questions please give me a call, I will follow up with Warren as well to discuss details such as location sites etc.

Cheers

Brad

Bradley Koroluk
Habitat Management Biologist
Ecosystems Management Branch
BC North Coast, Fisheries and Oceans Canada
Box 130, Bella Coola BC, V0T 1C0
Telephone: (250) 799-5729, Fax: (250) 799-5540 Iridium: 881631629520

Bradley.Koroluk@dfo-mpo.gc.ca

Please visit DFO's Website: <http://www.pac.dfo-mpo.gc.ca/habitat/index-eng.htm>

From: Warren Appleton [mailto:warren@balanced.ca]

Sent: October 1, 2012 12:48 PM

To: Koroluk, Bradley

Cc: Brad Moffat

Subject: Stewart Marsh Photos

Bradley,

We are currently looking into the feasibility of Airport Creek.

Further to the option of salt marsh construction, attached are a few photos of where we looked on site and have provided some rational why salt marsh was proposed:

- Salt marshes are of great importance to marine ecosystems in areas where deposition of silt results in limited photosynthetic productivity below the surface. This is particularly true in Stewart. Generation of phytoplankton is low as the sunlight cannot penetrate muddy water from the Bear River.
- Salt marshes offer canopy to hide from predators which inundated by the tide (a large number of species prey on juvenile salmon).
- Even though salt marshes are usually only narrow bands, they are the principal source of food source for sea creatures.
 - The "nutrient pump" results in the generation of detritus from the absorption of nutrients on the incoming tide, growth and decay of plants, which eventually fall and die. The majority of the detritus is pumped to sea and some is also consumed by organisms in the mudflats below. The detritus is food for bacteria, protozoans, small invertebrates, and clams, which in turn are eaten by larger invertebrates, fish, birds and mammals.
 - Salt marshes have an abundance of insects which are an important food source for many species including juvenile coho, which prefer aquatic insects like mayflies, caddis flies and stoneflies. Juvenile salmon also like terrestrial insects and small crustaceans, or larvae and insects.

Salt marsh is particularly important because of the focussing of juvenile coho that occupy the site. The construction of salt marsh in this particular location will provide additional food and shelter fish. Salt marsh was proposed because on previous projects it was accepted as high value compensation by DFO (in the past 9 years I have observed ratios of 6:1, 3:1 and 1:1 marsh : mud/sand/pebble on approved Authorizations).

In terms of the success of salt marshes, they tend to perform poorly in wave exposed areas and great in wave protected areas. For example, at the mouth of the bear river, a salt marsh would not perform well as the fine sediments would not stay. It makes more sense to construct one where there is wave protection and natural deposition of fines like at the proposed site.

If you have any questions please give me a call.

Regards,

Warren Appleton, RPBio

Senior Project Biologist,

Balanced Environmental Services Inc.

118 Garden Ave., North Vancouver, B.C. V7P 3H2

Phone. 604.988.3033 | Fax. 604.988.3026 | www.balanced.ca

This e-mail and any attachments are considered confidential and privileged information. If you are not the intended recipient, please notify the sender immediately by return e-mail, delete this e-mail and destroy any copies. The information provided is intended for the recipient only and shall not be referenced, forwarded, printed, posted, or otherwise used without the expressed written consent of Balanced Environmental.



Please consider the environment before printing this e-mail



Fisheries and Oceans Canada Pêches et Océans Canada

Fisheries and Oceans Canada
Box 130
Bella Coola, BC
V0T 1C0

August 22, 2012

Your file *Votre référence*
Barge Ramp Relocation Project

Our file *Notre référence*
12-HPAC-PA4-00248

Brad Moffat
Stewart World Port Services Ltd.
11421 Alaska Road
Fort Saint John, BC

Dear Mr. Moffat:

Subject: Proposal likely to result in impacts to fish and fish habitat. DFO authorization required.

Fisheries and Oceans Canada - Fish Habitat Management Program (DFO) received your proposal for review at this office on August 17, 2012. Please refer to the file number and title below:

DFO File No.: **12-HPAC-PA4-00248**
Title: **Barge Ramp Relocation Project**

You may be aware of recent changes to the *Fisheries Act*, however these have not affected the review of your project at this time. For more information on current changes to the *Fisheries Act*, as well as changes taking effect in the coming months, please refer to the DFO website www.dfo-mpo.gc.ca/habitat/habitat-eng.htm.

Your proposal has been reviewed to determine whether it is likely to result in impacts to fish and fish habitat which are prohibited by the habitat protection provisions of the *Fisheries Act*, or by those prohibitions of the *Species at Risk Act* that apply to aquatic species.*

Our review consisted of:

File 5397-F-0004.1_NWPA Form
File 5397-R-02.1 Stewart Barge Ramp (PRAF)

We understand that you propose to relocate an existing barge ramp facility to deeper water; which will be accomplished by extending the existing structure with a causeway and pilings at the Bear River estuary. The project as proposed has a footprint of 12,470m².

Based on the above information DFO has concluded that your proposal is likely to result in impacts to fish and fish habitat. Of particular concern is the potential for your proposal to result in the harmful alteration or disruption, or the destruction of fish habitat, which is prohibited under Section 35 of the *Fisheries Act*. In order to be in compliance with the above legislation you must

*Those sections most relevant to the review of development proposals include 20, 22, 32 and 35 of the *Fisheries Act* and sections 32, 33 and 58 of the *Species at Risk Act*. For more information please visit www.dfo-mpo.gc.ca.

obtain an authorization from DFO. In most cases the issuance of a *Fisheries Act* authorization is conditional on developing habitat compensation and monitoring plans to offset harm to fish habitat.

In order for us to continue processing your request please provide additional information regarding:

- The complete foreshore/intertidal fish habitat assessment report for the proposed area.
- The habitat compensation plan, including mitigation measures to offset the loss of fish habitat. In most cases, this offset is a condition for issuing the authorization.
- A monitoring plan that will ensure habitat compensation and mitigation measures function properly.
- Additional information and clarification regarding the means of assessment and measures to protect SARA listed species which may use this area will be considered as part of this assessment. More information can be found at www.sararegistry.gc.ca
- Assessment of fish presence/absence and utilization of this area; including salmonids, eulachon and herring. Any mitigation measures that will minimize or avoid negative impacts to them.

Please be advised that any impacts to fish and fish habitat which result from proceeding with your proposal without first obtaining a *Fisheries Act* authorization could lead to corrective action such as enforcement. In addition, under the new *Fisheries Act*, there is a requirement to notify DFO of any harmful alteration or disruption, or any destruction, of fish habitat that has not been authorized. Such notifications should be directed to DFO Prince Rupert office.

I would also like to make arrangements for an onsite visit in September if possible.

If you have any questions please contact Bradley Koroluk at our Bella Coola office at 250-799-5729, by fax at 250799-5540, or by email at Bradley.Koroluk@dfo-mpo.gc.ca

Sincerely,



Bradley Koroluk
Habitat Management Biologist

Cc: Joy Hillier – Section Head, DFO Prince Rupert
Warren Appleton – Balanced Environmental Service

APPENDIX 2 – FIRST NATIONS CORRESPONDENCE



Fisheries
and Oceans

Pêches
et Océans

Pacific Region
Fisheries and Oceans Canada
Box 130
Bella Coola, BC V0T 1C0

September 25, 2012

Harry Nyce Sr.
Director, Fish and Wildlife
Nisga'a Lisims Government
Email: eagle1@nisgaa.net

Dear Mr. Nyce Sr.;

Subject: Second Request - Review of proposed Barge Ramp Relocation Project at Bear River Estuary, Stewart BC.

Fisheries and Oceans Canada (DFO) has received a proposal from Stewart World Port Services Ltd. to extend an existing barge ramp near the Bear River estuary in Stewart. The site is located on the Portland Canal between the Stewart estuary and the Bear River at an existing log dump. The project involves construction of a gravel and rip-rap extension of the existing causeway, installation of steel pilings and floating ramp. Please refer to the attached project description previously provided, which provides information on the current plans for the project. If you require the project description please contact me directly.

DFO has determined that the proposed project is likely to require an Authorization under Section 35 (2) of the *Fisheries Act*. DFO is at the early stages of review for this project and in order to fully assess the fisheries impacts related to the construction of the proposed project, we must understand and consider the potential impacts to current and traditional fisheries related uses of the area by aboriginal peoples.

DFO would like to invite your input regarding the project as it relates to fisheries interests of the Nisga'a Lisims Nation. In order to consider potential impacts on current or traditional uses of the area, the following information (for example) would be particularly useful:

- 1) What current or traditional fishing activities are undertaken in the project area?
- 2) How would the proposed project impact those activities?
- 3) Can you suggest a way to mitigate the impact of the project on those activities?

- 2 -

On behalf of DFO I look forward to exchanging information with you and learning about Nisga'a Lisims interest in the proposed project. Should you have any questions or comments, please contact me (250-799-5729; Bradley.Koroluk@dfo-mpo.gc.ca) at your convenience to discuss the project.

Sincerely,

A handwritten signature in cursive script, appearing to read "Bradley Koroluk".

Bradley Koroluk,
Habitat Management Biologist
Ecosystems Management Branch
North Coast Area

Cc:

Joy Hillier: Section Head, North Coast Area - Ecosystems Management Branch
Brad Moffat: Stewart World Port Services Ltd.
Warren Appleton: Balanced Environmental Service



Fisheries
and Oceans

Pêches
et Océans

Pacific Region
Fisheries and Oceans Canada
Box 130
Bella Coola, BC V0T 1C0

August 29, 2012

Harry Nyce Sr.
Director, Fish and Wildlife
Nisga'a Lisims Government
Email: eagle1@nisgaa.net

(Via email)

Dear Mr. Nyce;

Subject: Review of proposed Barge Ramp Relocation Project at Bear River Estuary, Stewart BC.

Fisheries and Oceans Canada (DFO) has received a proposal from Stewart World Port Services Ltd. to extend an existing barge ramp near the Bear River estuary in Stewart. The site is located on the Portland Canal between the Stewart estuary and the Bear River at an existing log dump. The project involves construction of a gravel and rip-rap extension of the existing causeway, installation of steel pilings and floating ramp. Please refer to the attached project description, which provides information on the current plans for the project.

DFO has determined that the proposed project is likely to require an Authorization under Section 35 (2) of the *Fisheries Act*. DFO is at the early stages of review for this project and in order to fully assess the fisheries impacts related to the construction of the proposed project, we must understand and consider the potential impacts to current and traditional fisheries related uses of the area by aboriginal peoples.

DFO would like to invite your input regarding the project as it relates to fisheries interests of the Nisga'a Lisims Nation. In order to consider potential impacts on current or traditional uses of the area, the following information (for example) would be particularly useful:

- 1) What current or traditional fishing activities are undertaken in the project area?
- 2) How would the proposed project impact those activities?
- 3) Can you suggest a way to mitigate the impact of the project on those activities?

- 2 -

On behalf of DFO I look forward to exchanging information with you and learning about Nisga'a Lisims interest in the proposed project. Should you have any questions or comments, please contact me (250-799-5729; Bradley.Koroluk@dfo-mpo.gc.ca) at your convenience to discuss the project.

Sincerely,



Bradley Koroluk,
Habitat Management Biologist
Ecosystems Management Branch
North Coast Area

Attachments: Project Description

Cc:

Joy Hillier: Section Head, North Coast Area - Ecosystems Management Branch
Brad Moffat: Stewart World Port Services Ltd.
Warren Appleton: Balanced Environmental Service

APPENDIX 3 – FISS DATABASE RESULTS

[Back](#) [Main Queries Page](#)**Fisheries Inventory - FISS Fish Distributions Report**

304 record(s) matched your query.

Report created on : Thu Jun 07 11:06:44 PDT 2012

Your report was based on the following criteria:

Gazetted Name/Alias : Bear River

Ordered By : Gazetted Name

Gazetted Name	Region Code	Species Name	Stock Type	Stock Char	Stock Management Name Class	Activity	Map 1	Point 1	Type 1	Map 2	Point 2	Type 2	Refs And Dates
AMOR DE COSMOS CREEK 1	CAL	Coastrange Sculpin (formerly Aleutian Sculpin)	NOT SPECIF	Fluvial	Wild indigenous	REA Rearing location	092K04	2063	P				(MJL004, 01-FEB-1
AMOR DE COSMOS CREEK 1	CCT	Coastal Cutthroat Trout	NOT SPECIF	Not Specif	Not Specified	REA Rearing location	092K04	2063	P				(MJL004, 01-FEB-1
AMOR DE COSMOS CREEK 1	CCT	Coastal Cutthroat Trout	NOT SPECIF	Not Specif	Not Specified	REA Rearing location	092K04	2107	P				(MJL004, 01-FEB-1
AMOR DE COSMOS CREEK 1	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone		309629	W				(13-1, 01-JAN-1977 (PH006, 01-JAN-19
AMOR DE COSMOS CREEK 1	CM	Chum Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone		309629	W				(CR001B, 01-JAN-1 (PH006, 01-JAN-19
AMOR DE COSMOS CREEK 1	CM	Chum Salmon	NOT SPECIF	Anadromous	Not Specified	SPM Major spawning location	092K05	2015	U	092K05	2016	D	(13-1, 01-JAN-1977 (CR001A, 01-JAN-1 (CR001B, 01-JAN-1 (M026, 01-JAN-199
AMOR DE COSMOS CREEK 1	CO	Coho Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone		309629	W				(PH006, 01-JAN-19
AMOR DE COSMOS CREEK 1	CO	Coho Salmon	NOT SPECIF	Anadromous	Not Specified	SPL Spawning location	092K05	2014	U				(13-1, 01-JAN-1977
AMOR DE COSMOS CREEK 1	PK	Pink Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone		309629	W				(CR001A, 01-JAN-1
AMOR DE COSMOS CREEK 1	PK	Pink Salmon	NOT SPECIF	Anadromous	Not Specified	SPM Major spawning location	092K05	2013	U				(CR001A, 01-JAN-1
AMOR DE COSMOS CREEK 1	PK	Pink Salmon	NOT SPECIF	Anadromous	Not Specified	SPM Major spawning location	092K05	2015	U	092K05	2016	D	(13-1, 01-JAN-1977 (M026, 01-JAN-199
AMOR DE COSMOS CREEK 1	PK	Pink Salmon	NOT SPECIF	Anadromous	Not Specified	SPM Major spawning location	092K05	2016	U				(CR001A, 01-JAN-1
AMOR DE COSMOS CREEK 1	RB	Rainbow Trout	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	092K05	2014	U				(HQ2059, 01-FEB-2
AMOR DE COSMOS CREEK 1	ST	Steelhead	NOT SPECIF	Anadromous	Not Specified	SPL Spawning location	092K05	2014	U				(13-1, 01-JAN-1977
AMOR DE COSMOS CREEK 1	ST	Steelhead	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or		309629	W				(DFO177, 01-FEB-2 (STLHD-SUM, no d

AMOR DE COSMOS CREEK	1	TSB	Threespine Stickleback	NOT SPECIF	Fluvial	Wild indigenous	zone REA Rearing location	092K04 2063	P	(MJL004, 01-FEB-1
AMOR DE COSMOS CREEK	1	WST	Steelhead (Winter-run)	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	092K05 2014	U	(HQ2059, 01-FEB-2
AMOR DE COSMOS CREEK	1	WST	Steelhead (Winter-run)	NOT SPECIF	Not Specif	Not Specified	REA Rearing location	092K05 2014	U	(HQ2059, 01-FEB-2
BEAR RIVER	2	DV	Dolly Varden	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	092K14 337194	P	(RABSVY-176317,
BEAR RIVER	2	DV	Dolly Varden	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	092K14 341450	P	(RABSVY-183270,
BEAR RIVER	2	DV	Dolly Varden	NOT SPECIF	Resident	Wild indigenous	OBL Fish observed at this point or zone	092K14 3	U	(1RABVIC, 01-APR
BEAR RIVER	2	DV	Dolly Varden	NOT SPECIF	Resident	Wild indigenous	OBL Fish observed at this point or zone	268876 W		(2FBSRY, 01-JAN-
BEAR RIVER	2	SP	Unidentified Species	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	092K14 337194	P	(RABSVY-176317,
BEAR RIVER	2	SP	Unidentified Species	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	092K14 341450	P	(RABSVY-183270,
BEAR RIVER	2	ST	Steelhead	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	268876 W		(STLHD-SUM, no d
BEAR RIVER	6	C	Minnow (General)	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	212120 W		(4D-165, 01-JAN-19
BEAR RIVER	6	CAS	Prickly Sculpin	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	212120 W		(4D-165, 01-JAN-19
BEAR RIVER	6	CBC	Chub (General)	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	212120 W		(4D-165, 01-JAN-19
BEAR RIVER	6	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	094D02 336131	P	(RABSVY-174464,
BEAR RIVER	6	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	094D02 336132	P	(RABSVY-174465,
BEAR RIVER	6	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	094D07 22	P	(HQ1338, 01-SEP-1
BEAR RIVER	6	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point	212120 W		(SC-537, 01-JAN-19 (SC-875, 01-JAN-19

BEAR RIVER	6	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	point or zone SPM Major spawning location	094D02 1	U	094D02 2	D	(4D-102, no date) (4D-92, no date)
BEAR RIVER	6	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	SPM Major spawning location	094D07 3	U	094D07 4	D	(4D-102, no date) (4D-92, no date)
BEAR RIVER	6	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	SPM Major spawning location	212120 W				(4D-102, no date) (4D-92, no date)
BEAR RIVER	6	CM	Chum Salmon	NOT SPECIF	Anadromous	Not Specified	SPL Spawning location	103P13 6	P			(SISSM01, 01-JAN-
BEAR RIVER	6	CM	Chum Salmon	NOT SPECIF	Anadromous	Not Specified	SPM Major spawning location	103P13 4	U	103P13 5	D	(SISSM01, 01-JAN-
BEAR RIVER	6	CO	Coho Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	094D02 336131 P				(RABSVY-174464,
BEAR RIVER	6	CO	Coho Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	094D02 336132 P				(RABSVY-174465,
BEAR RIVER	6	CO	Coho Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	212120 W				(4D-92, no date)
BEAR RIVER	6	CO	Coho Salmon	NOT SPECIF	Anadromous	Not Specified	SPL Spawning location	103P13 7	P			(SISSM01, 01-JAN-
BEAR RIVER	6	CO	Coho Salmon	NOT SPECIF	Anadromous	Not Specified	SPL Spawning location	104A04 7	P			(SISSM01, 01-JAN-
BEAR RIVER	6	CO	Coho Salmon	NOT SPECIF	Anadromous	Not Specified	SPM Major spawning location	103P13 4	U	103P13 5	D	(SISSM01, 01-JAN-

BEAR RIVER	6	CO	Coho Salmon	NOT SPECIF	Anadromous	Not Specified	SPM Major spawning location	104A04 4	U	104A04 3	D	(SISSM01, 01-JAN-19)
BEAR RIVER	6	DV	Dolly Varden	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	212120 W				(SC-383, 01-JAN-19)
BEAR RIVER	6	L	Lamprey (General)	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	212120 W				(4D-165, 01-JAN-19)
BEAR RIVER	6	LNC	Longnose Dace	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	094D07 2	P			(SC-875, 01-JAN-19)
BEAR RIVER	6	LNC	Longnose Dace	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	212120 W				(4D-165, 01-JAN-19) (SC-537, 01-JAN-19)
BEAR RIVER	6	MW	Mountain Whitefish	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	212120 W				(SC-537, 01-JAN-19)
BEAR RIVER	6	PK	Pink Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	094D02 336131 P				(RABSVY-174464,
BEAR RIVER	6	PK	Pink Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	094D02 336132 P				(RABSVY-174465,
BEAR RIVER	6	RB	Rainbow Trout	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	094D02 336131 P				(RABSVY-174464,
BEAR RIVER	6	RB	Rainbow Trout	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	094D02 336132 P				(RABSVY-174465,
BEAR RIVER	6	RB	Rainbow Trout	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	094D07 22	P			(HQ1338, 01-SEP-19)
BEAR RIVER	6	RB	Rainbow Trout	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	212120 W				(4D-165, 01-JAN-19) (4D-22, no date) (4D-92, no date)
BEAR RIVER	6	SK	Sockeye Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	094D02 336131 P				(RABSVY-174464,
BEAR RIVER	6	SK	Sockeye Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	094D02 336132 P				(RABSVY-174465,
BEAR	6	SK	Sockeye	NOT	Anadromous	Not Specified	OBL Fish observed at this	212120 W				(4D-92, no date)

RIVER			Salmon	SPECIF			point or zone						
BEAR RIVER	6	ST	Steelhead	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	094D02 336131 P					(RABSVY-174464,
BEAR RIVER	6	ST	Steelhead	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	094D02 336132 P					(RABSVY-174465,
BEAR RIVER	6	ST	Steelhead	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	212120 W					(SC-383, 01-JAN-19
BEAR RIVER	6	ST	Steelhead	NOT SPECIF	Anadromous	Not Specified	SPL Spawning location	094D02 5	U	094D02 6	D		(4D-102, no date)
BEAR RIVER	6	ST	Steelhead	NOT SPECIF	Anadromous	Not Specified	SPM Major spawning location	094D02 1	U	094D02 4	D		(4D-102, no date)
BEAR RIVER	6	ST	Steelhead	NOT SPECIF	Anadromous	Not Specified	SPM Major spawning location	094D07 3	U	094D07 5	D		(4D-1, no date) (4D-102, no date) (4D-22, no date)
BEAR RIVER	6	ST	Steelhead	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	295181 W					(STLHD-SUM, no d
BEDWELL RIVER	1	ACT	Cutthroat Trout (Anadromous)	NOT SPECIF	Anadromous	Wild indigenous	OBL Fish observed at this point or zone	319553 W					(14-5, no date)
BEDWELL RIVER	1	CAL	Coastrange Sculpin (formerly Aleutian Sculpin)	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	092F05 343292 P					(24-9, 01-JAN-1989
BEDWELL RIVER	1	CAL	Coastrange Sculpin (formerly Aleutian Sculpin)	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	092F05 343296 P					(24-9, 01-JAN-1989
BEDWELL RIVER	1	CAS	Prickly Sculpin	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	092F05 343292 P					(24-9, 01-JAN-1989
BEDWELL RIVER	1	CAS	Prickly Sculpin	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	092F05 343296 P					(24-9, 01-JAN-1989
BEDWELL RIVER	1	CAS	Prickly Sculpin	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	092F05 343300 P					(24-9, 01-JAN-1989
BEDWELL RIVER	1	CC	Sculpin (General)	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	092F05 63	P				(24-21, 01-JAN-199
BEDWELL RIVER	1	CC	Sculpin (General)	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	092F05 64	P				(24-21, 01-JAN-199

BEDWELL RIVER	1	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	at this point or zone	092F05 344675 U					(HQ2764, 01-JAN-1
BEDWELL RIVER	1	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	319553 W					(HQ2764, 01-JAN-1
BEDWELL RIVER	1	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	SPM Major spawning location	092F05 14 U	092F05 13	D			(24-1, 01-JAN-1979
BEDWELL RIVER	1	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	SPM Major spawning location	092F05 17 U	092F05 16	D			(24-1, 01-JAN-1979
BEDWELL RIVER	1	CM	Chum Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	092F05 344675 U					(HQ2764, 01-JAN-1
BEDWELL RIVER	1	CM	Chum Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	319553 W					(HQ2764, 01-JAN-1
BEDWELL RIVER	1	CM	Chum Salmon	NOT SPECIF	Anadromous	Not Specified	SPM Major spawning location	092F05 15 U	092F05 12	D			(24-1, 01-JAN-1979
BEDWELL RIVER	1	CO	Coho Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	092F05 343292 P					(24-9, 01-JAN-1989
BEDWELL RIVER	1	CO	Coho Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	092F05 343296 P					(24-9, 01-JAN-1989
BEDWELL RIVER	1	CO	Coho Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	092F05 343300 P					(24-9, 01-JAN-1989
BEDWELL RIVER	1	CO	Coho Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	092F05 344675 U					(HQ2764, 01-JAN-1
BEDWELL RIVER	1	CO	Coho Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	319553 W					(HQ2764, 01-JAN-1
BEDWELL RIVER	1	CO	Coho Salmon	NOT SPECIF	Anadromous	Not Specified	SPM Major spawning location	092F05 19 U	092F05 18	D			(24-1, 01-JAN-1979
BEDWELL RIVER	1	CT	Cutthroat Trout	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	319553 W					(HQ2764, 01-JAN-1
BEDWELL RIVER	1	CT	Cutthroat Trout	NOT SPECIF	Resident	Wild indigenous	OBL Fish observed at this point or zone	319553 W					(14-9, 01-JAN-1993
BEDWELL RIVER	1	PK	Pink Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	092F05 344675 U					(HQ2764, 01-JAN-1
BEDWELL RIVER	1	PK	Pink Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	319553 W					(24-1, 01-JAN-1979
							OBL Fish						

BEDWELL RIVER	1	RB	Rainbow Trout	NOT SPECIF	Not Specif	Not Specified	observed at this point or zone	092F05 343292 P	(24-9, 01-JAN-1989
BEDWELL RIVER	1	RB	Rainbow Trout	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	092F05 343296 P	(24-9, 01-JAN-1989
BEDWELL RIVER	1	RB	Rainbow Trout	NOT SPECIF	Resident	Wild indigenous	OBL Fish observed at this point or zone	092F05 64 P	(24-21, 01-JAN-199
BEDWELL RIVER	1	RB	Rainbow Trout	NOT SPECIF	Resident	Wild indigenous	OBL Fish observed at this point or zone	319553 W	(24-9, 01-JAN-1989
BEDWELL RIVER	1	SB	Stickleback (General)	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	092F05 343300 P	(24-9, 01-JAN-1989
BEDWELL RIVER	1	SK	Sockeye Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	092F05 64 P	(24-21, 01-JAN-199
BEDWELL RIVER	1	SK	Sockeye Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	092F05 344675 U	(HQ2764, 01-JAN-1
BEDWELL RIVER	1	ST	Steelhead	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	092F05 344675 U	(HQ2764, 01-JAN-1
BEDWELL RIVER	1	ST	Steelhead	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	319553 W	(HQ2764, 01-JAN-1
BEDWELL RIVER	1	ST	Steelhead	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	319553 W	(STLHD-SUM, no d
BEDWELL RIVER	1	ST	Steelhead	WINTER	Anadromous	Wild indigenous	OBL Fish observed at this point or zone	319553 W	(14-5, no date)
BOWRON RIVER	5	BB	Burbot	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 518 P	(29I-105, 01-JAN-19
BOWRON RIVER	5	BB	Burbot	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H12 532 P	(EDI0002, 01-JAN-1
BOWRON RIVER	5	BB	Burbot	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	17099 W	(29I-5, 01-JAN-198
BOWRON RIVER	5	BT	Bull Trout	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	17099 W	(LM4696, 01-JAN-1
BOWRON RIVER	5	CC	Sculpin (General)	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H05 502 P	(29I-105, 01-JAN-19

BOWRON RIVER	5	CC	Sculpin (General)	NOT SPECIF	Fluvial	Wild indigenous	at this point or zone	093H05 503	P	(29I-105, 01-JAN-19
BOWRON RIVER	5	CC	Sculpin (General)	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H05 504	P	(29I-105, 01-JAN-19
BOWRON RIVER	5	CC	Sculpin (General)	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H05 506	P	(29I-105, 01-JAN-19
BOWRON RIVER	5	CC	Sculpin (General)	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H05 507	P	(29I-105, 01-JAN-19
BOWRON RIVER	5	CC	Sculpin (General)	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H05 508	P	(29I-105, 01-JAN-19
BOWRON RIVER	5	CC	Sculpin (General)	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 502	P	(29I-105, 01-JAN-19
BOWRON RIVER	5	CC	Sculpin (General)	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 504	P	(29I-105, 01-JAN-19
BOWRON RIVER	5	CC	Sculpin (General)	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 505	P	(29I-105, 01-JAN-19
BOWRON RIVER	5	CC	Sculpin (General)	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 507	P	(29I-105, 01-JAN-19
BOWRON RIVER	5	CC	Sculpin (General)	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 509	P	(29I-105, 01-JAN-19
BOWRON RIVER	5	CC	Sculpin (General)	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 510	P	(29I-105, 01-JAN-19
BOWRON RIVER	5	CC	Sculpin (General)	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 511	P	(29I-105, 01-JAN-19
BOWRON RIVER	5	CC	Sculpin (General)	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 512	P	(29I-105, 01-JAN-19
BOWRON RIVER	5	CC	Sculpin (General)	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 513	P	(29I-105, 01-JAN-19
BOWRON RIVER	5	CC	Sculpin (General)	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 514	P	(29I-105, 01-JAN-19
BOWRON RIVER	5	CC	Sculpin (General)	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 517	P	(29I-105, 01-JAN-19
BOWRON	5	CC	Sculpin	NOT	Fluvial	Wild	OBL Fish observed at this	093H06 518	P	(29I-105, 01-JAN-19

RIVER		(General)	SPECIF		indigenous	point or zone			
BOWRON RIVER	5	CC	Sculpin (General)	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 519	P (29I-105, 01-JAN-19)
BOWRON RIVER	5	CC	Sculpin (General)	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H12 502	P (29I-105, 01-JAN-19)
BOWRON RIVER	5	CC	Sculpin (General)	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H12 503	P (29I-105, 01-JAN-19)
BOWRON RIVER	5	CC	Sculpin (General)	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H12 506	P (29I-105, 01-JAN-19)
BOWRON RIVER	5	CC	Sculpin (General)	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H12 507	P (29I-105, 01-JAN-19)
BOWRON RIVER	5	CC	Sculpin (General)	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H12 509	P (29I-105, 01-JAN-19)
BOWRON RIVER	5	CC	Sculpin (General)	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H12 510	P (29I-105, 01-JAN-19)
BOWRON RIVER	5	CC	Sculpin (General)	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H12 511	P (29I-105, 01-JAN-19)
BOWRON RIVER	5	CC	Sculpin (General)	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H12 532	P (EDI0002, 01-JAN-19)
BOWRON RIVER	5	CC	Sculpin (General)	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H13 502	P (29I-105, 01-JAN-19)
BOWRON RIVER	5	CC	Sculpin (General)	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	17099 W	P (29I-5, 01-JAN-198)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	093H12 532	P (EDI0002, 01-JAN-19)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	093H05 502	P (29I-105, 01-JAN-19)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	093H05 503	P (29I-105, 01-JAN-19)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	093H05 504	P (29I-105, 01-JAN-19)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	093H05 506	P (29I-105, 01-JAN-19)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	093H05 507	P (29I-105, 01-JAN-19)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	093H05 508	P (29I-105, 01-JAN-19)

BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	093H05 509	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	093H06 502	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	093H06 503	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	093H06 504	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	093H06 505	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	093H06 507	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	093H06 508	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	093H06 509	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	093H06 510	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	093H06 511	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	093H06 512	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	093H06 513	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	093H06 514	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	093H06 517	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	093H06 518	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	093H06 519	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	093H12 502	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	093H12 504	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	093H12 505	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	093H12 506	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	093H12 508	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	093H12 509	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	093H12 510	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	093H12 511	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	093H12 512	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	093H13 502	P	(29I-105, 01-JAN-19)

BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	093H13 506	P				(29I-105, 01-JAN-1985)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	093H13 507	P				(29I-105, 01-JAN-1985)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	093H13 509	P				(29I-105, 01-JAN-1985)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	REA Rearing location	17099	W				(29I-105, 01-JAN-1985)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	SPM Major spawning location	093H05 600	U	093H05 508	D		(29I-105, 01-JAN-1985)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	SPM Major spawning location	093H05 602	U	093H05 601	D		(29I-105, 01-JAN-1985)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	SPM Major spawning location	093H05 603	U	093H05 503	D		(29I-105, 01-JAN-1985)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	SPM Major spawning location	093H06 501	U	093H06 600	D		(29I-105, 01-JAN-1985)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	SPM Major spawning location	093H06 512	U	093H06 602	D		(SISSM01, 01-JAN-1985)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	SPM Major spawning location	093H06 517	U	093H06 603	D		(SISSM01, 01-JAN-1985)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	SPM Major spawning location	093H06 601	U	093H06 511	D		(SISSM01, 01-JAN-1985)
BOWRON RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	SPM Major spawning location	093H13 2	U	093H13 1	D		(29I-2, 01-JAN-1985)
BOWRON RIVER	5	CO	Coho Salmon	NOT SPECIF	Anadromous	Wild indigenous	OBL Fish observed at this point or zone	17099	W				(DFO0460, 01-JAN-1985)
BOWRON RIVER	5	CSU	Largescale Sucker	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H05 506	P				(29I-105, 01-JAN-1985)
BOWRON RIVER	5	CSU	Largescale Sucker	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H05 507	P				(29I-105, 01-JAN-1985)
BOWRON RIVER	5	CSU	Largescale Sucker	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H05 508	P				(29I-105, 01-JAN-1985)
BOWRON RIVER	5	CSU	Largescale Sucker	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 501	P				(29I-105, 01-JAN-1985)
BOWRON RIVER	5	CSU	Largescale Sucker	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 502	P				(29I-105, 01-JAN-1985)
BOWRON RIVER	5	CSU	Largescale Sucker	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 505	P				(29I-105, 01-JAN-1985)
							OBL Fish						

BOWRON RIVER	5	CSU	Largescale Sucker	NOT SPECIF	Fluvial	Wild indigenous	observed at this point or zone	093H06 508	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	CSU	Largescale Sucker	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 514	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	CSU	Largescale Sucker	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	093H12 502	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	CSU	Largescale Sucker	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	093H13 507	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	CSU	Largescale Sucker	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	17099	W	(29I-5, 01-JAN-198)
BOWRON RIVER	5	DV	Dolly Varden	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 510	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	DV	Dolly Varden	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H12 502	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	DV	Dolly Varden	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H12 505	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	DV	Dolly Varden	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H12 510	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	DV	Dolly Varden	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H13 506	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	DV	Dolly Varden	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	17099	W	(29I-87, 01-JAN-198)
BOWRON RIVER	5	KO	Kokanee	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	17099	W	(LM4696, 01-JAN-1)
BOWRON RIVER	5	LDC	Leopard Dace	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	17099	W	(29I-105, 01-JAN-19)
BOWRON RIVER	5	LNC	Longnose Dace	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H05 502	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	LNC	Longnose Dace	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H05 504	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	LNC	Longnose Dace	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H05 508	P	(29I-105, 01-JAN-19)

BOWRON RIVER	5	LNC	Longnose Dace	NOT SPECIF	Fluvial	Wild indigenous	at this point or zone	093H06 510	P	(29I-105, 01-JAN-19
BOWRON RIVER	5	LNC	Longnose Dace	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 518	P	(29I-105, 01-JAN-19
BOWRON RIVER	5	LNC	Longnose Dace	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H12 502	P	(29I-105, 01-JAN-19
BOWRON RIVER	5	LNC	Longnose Dace	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H12 504	P	(29I-105, 01-JAN-19
BOWRON RIVER	5	LNC	Longnose Dace	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H12 508	P	(29I-105, 01-JAN-19
BOWRON RIVER	5	LNC	Longnose Dace	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H12 510	P	(29I-105, 01-JAN-19
BOWRON RIVER	5	LNC	Longnose Dace	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	17099	W	(29I-5, 01-JAN-198
BOWRON RIVER	5	LSU	Longnose Sucker	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	17099	W	(29I-105, 01-JAN-19
BOWRON RIVER	5	LT	Lake Trout	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	17099	W	(LM4696, 01-JAN-1
BOWRON RIVER	5	MW	Mountain Whitefish	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H05 502	P	(29I-105, 01-JAN-19
BOWRON RIVER	5	MW	Mountain Whitefish	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H05 503	P	(29I-105, 01-JAN-19
BOWRON RIVER	5	MW	Mountain Whitefish	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H05 504	P	(29I-105, 01-JAN-19
BOWRON RIVER	5	MW	Mountain Whitefish	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H05 506	P	(29I-105, 01-JAN-19
BOWRON RIVER	5	MW	Mountain Whitefish	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H05 507	P	(29I-105, 01-JAN-19
BOWRON RIVER	5	MW	Mountain Whitefish	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H05 508	P	(29I-105, 01-JAN-19
BOWRON RIVER	5	MW	Mountain Whitefish	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H05 509	P	(29I-105, 01-JAN-19
BOWRON	5	MW	Mountain	NOT	Fluvial	Wild	OBL Fish observed at this	093H06 501	P	(29I-105, 01-JAN-19

RIVER		Whitefish	SPECIF		indigenous	point or zone			
BOWRON RIVER	5	MW	Mountain Whitefish	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 502	P (29I-105, 01-JAN-19
BOWRON RIVER	5	MW	Mountain Whitefish	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 503	P (29I-105, 01-JAN-19
BOWRON RIVER	5	MW	Mountain Whitefish	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 504	P (29I-105, 01-JAN-19
BOWRON RIVER	5	MW	Mountain Whitefish	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 505	P (29I-105, 01-JAN-19
BOWRON RIVER	5	MW	Mountain Whitefish	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 507	P (29I-105, 01-JAN-19
BOWRON RIVER	5	MW	Mountain Whitefish	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 509	P (29I-105, 01-JAN-19
BOWRON RIVER	5	MW	Mountain Whitefish	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 510	P (29I-105, 01-JAN-19
BOWRON RIVER	5	MW	Mountain Whitefish	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 513	P (29I-105, 01-JAN-19
BOWRON RIVER	5	MW	Mountain Whitefish	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 514	P (29I-105, 01-JAN-19
BOWRON RIVER	5	MW	Mountain Whitefish	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 517	P (29I-105, 01-JAN-19
BOWRON RIVER	5	MW	Mountain Whitefish	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 518	P (29I-105, 01-JAN-19
BOWRON RIVER	5	MW	Mountain Whitefish	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 519	P (29I-105, 01-JAN-19
BOWRON RIVER	5	MW	Mountain Whitefish	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H12 502	P (29I-105, 01-JAN-19
BOWRON RIVER	5	MW	Mountain Whitefish	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H12 503	P (29I-105, 01-JAN-19
BOWRON RIVER	5	MW	Mountain Whitefish	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H12 507	P (29I-105, 01-JAN-19
BOWRON RIVER	5	MW	Mountain Whitefish	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or	093H12 508	P (29I-105, 01-JAN-19

BOWRON RIVER	5	MW	Mountain Whitefish	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H12 509	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	MW	Mountain Whitefish	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H12 510	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	MW	Mountain Whitefish	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H12 511	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	MW	Mountain Whitefish	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H12 512	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	MW	Mountain Whitefish	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H13 502	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	MW	Mountain Whitefish	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H13 504	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	MW	Mountain Whitefish	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H13 506	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	MW	Mountain Whitefish	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H13 507	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	MW	Mountain Whitefish	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H13 509	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	MW	Mountain Whitefish	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	17099	W	(29I-87, 01-JAN-19)
BOWRON RIVER	5	MW	Mountain Whitefish	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	17099	W	(LM4696, 01-JAN-19)
BOWRON RIVER	5	NSC	Northern Pikeminnow	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 505	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	NSC	Northern Pikeminnow	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 507	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	NSC	Northern Pikeminnow	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 508	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	NSC	Northern Pikeminnow	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 513	P	(29I-105, 01-JAN-19)
BOWRON RIVER	5	NSC	Northern Pikeminnow	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	093H06 504	P	(29I-105, 01-JAN-19)

BOWRON RIVER	5	NSC	Northern Pikeminnow	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	17099	W			(29I-5, 01-JAN-198
BOWRON RIVER	5	PW	Pygmy Whitefish	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	17099	W			(LM4696, 01-JAN-1
BOWRON RIVER	5	RB	Rainbow Trout	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H05 503	P			(29I-105, 01-JAN-19
BOWRON RIVER	5	RB	Rainbow Trout	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H05 504	P			(29I-105, 01-JAN-19
BOWRON RIVER	5	RB	Rainbow Trout	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H06 502	P			(29I-105, 01-JAN-19
BOWRON RIVER	5	RB	Rainbow Trout	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	17099	W			(29I-87, 01-JAN-198
BOWRON RIVER	5	RB	Rainbow Trout	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	093H13 504	P			(29I-105, 01-JAN-19
BOWRON RIVER	5	RB	Rainbow Trout	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	093H13 341853	P			(RABSVY-183701, 1
BOWRON RIVER	5	RB	Rainbow Trout	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	17099	W			(LM4696, 01-JAN-1
BOWRON RIVER	5	RSC	Redside Shiner	NOT SPECIF	Fluvial	Wild indigenous	OBL Fish observed at this point or zone	093H12 503	P			(29I-105, 01-JAN-19
BOWRON RIVER	5	RSC	Redside Shiner	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	17099	W			(29I-5, 01-JAN-198
BOWRON RIVER	5	SK	Sockeye Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	093H03 5	P			(SISSM01, 01-JAN-
BOWRON RIVER	5	SK	Sockeye Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	17099	W			(29I-2, 01-JAN-198;
BOWRON RIVER	5	SK	Sockeye Salmon	NOT SPECIF	Anadromous	Not Specified	SPL Spawning location	093H03 8	P			(SISSM01, 01-JAN-
BOWRON RIVER	5	SK	Sockeye Salmon	NOT SPECIF	Anadromous	Not Specified	SPM Major spawning location	093H03 7	U	093H03 6	D	(29I-2, 01-JAN-198;
BOWRON RIVER	5	WSG	White Sturgeon	NOT SPECIF	Adfluvial	Wild indigenous	OBL Fish observed at this point or zone	093G16 1003	P			(HQ1716, 01-APR-'
BOWRON RIVER	5	WSG	White Sturgeon	NOT SPECIF	Adfluvial	Wild indigenous	OBL Fish observed at this point or	093I04 1004	P			(HQ1716, 01-APR-'

BOWRON RIVER	5	WSG	White Sturgeon	NOT SPECIF	Adfluvial	Wild indigenous	zone OBL Fish observed at this point or zone	17099	W	(HQ1716, 01-APR-1971)
MILLS CREEK	1	CM	Chum Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	092L11	2058 P	(12B-20, no date)
MILLS CREEK	1	CM	Chum Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	314114	W	(PH006, 01-JAN-1972)
MILLS CREEK	1	CM	Chum Salmon	NOT SPECIF	Anadromous	Not Specified	SPL Spawning location	314114	W	(PH029, 01-JAN-1972)
MILLS CREEK	1	CO	Coho Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	092L11	2060 U	(12B-1, 01-JAN-1972)
MILLS CREEK	1	CO	Coho Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	314114	W	(PH006, 01-JAN-1972) (PH029, 01-JAN-1972)
MILLS CREEK	1	PK	Pink Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	092L11	2058 P	(12B-20, no date)
MILLS CREEK	1	PK	Pink Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	314114	W	(PH006, 01-JAN-1972)
MILLS CREEK	1	PK	Pink Salmon	NOT SPECIF	Anadromous	Not Specified	SPL Spawning location	092L11	2058 U	(PH029, 01-JAN-1972)
MILLS CREEK	1	PK	Pink Salmon	NOT SPECIF	Anadromous	Not Specified	SPL Spawning location	314114	W	(PH029, 01-JAN-1972)
MUSSEL RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	103A16	9015 P	(BC-062, 01-JAN-1981)
MUSSEL RIVER	5	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	286563	W	(7-1, 01-JAN-1981)
MUSSEL RIVER	5	CM	Chum Salmon	NOT SPECIF	Anadromous	Not Specified	SPL Spawning location	103A16	9015 P	(7-1, 01-JAN-1981) (7-22, 01-JAN-1989)
MUSSEL RIVER	5	CO	Coho Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	103A16	9017 P	(BC-062, 01-JAN-1981)
MUSSEL RIVER	5	CO	Coho Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	286563	W	(7-1, 01-JAN-1981)
MUSSEL RIVER	5	DV	Dolly Varden	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	286563	W	(7-22, 01-JAN-1989)
MUSSEL RIVER	5	PK	Pink Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	103A16	9017 P	(BC-062, 01-JAN-1981)

MUSSEL RIVER	5	PK	Pink Salmon	NOT SPECIF	Anadromous	Not Specified	zone SPL Spawning location	103A16 9015	P	(7-1, 01-JAN-1981) (7-22, 01-JAN-1989)
MUSSEL RIVER	5	RB	Rainbow Trout	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	286563 W		(7-22, 01-JAN-1989)
MUSSEL RIVER	5	SK	Sockeye Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	103A16 9017	P	(BC-062, 01-JAN-1981)
MUSSEL RIVER	5	SK	Sockeye Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	286563 W		(7-1, 01-JAN-1981)
MUSSEL RIVER	5	ST	Steelhead	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	286563 W		(7-22, 01-JAN-1989)
MUSSEL RIVER	5	ST	Steelhead	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	286563 W		(STLHD-SUM, no d
SUCWOA RIVER	1	CH	Chinook Salmon	NOT SPECIF	Anadromous	Not Specified	SPL Spawning location	092E15 15	U	(25-2, 01-JAN-1979)
SUCWOA RIVER	1	CM	Chum Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	092E15 15	U	(HQ1106, 01-FEB-1
SUCWOA RIVER	1	CM	Chum Salmon	NOT SPECIF	Anadromous	Not Specified	SPL Spawning location	092E15 15	U	(25-2, 01-JAN-1979)
SUCWOA RIVER	1	CO	Coho Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	092E15 6	U	(25-2, 01-JAN-1979)
SUCWOA RIVER	1	CO	Coho Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	322117 W		(HQ1106, 01-FEB-1
SUCWOA RIVER	1	CT	Cutthroat Trout	NOT SPECIF	Adfluvial	Wild indigenous	OBL Fish observed at this point or zone	322117 W		(14-9, 01-JAN-1993)
SUCWOA RIVER	1	PK	Pink Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	092E15 15	U	(HQ1106, 01-FEB-1
SUCWOA RIVER	1	PK	Pink Salmon	NOT SPECIF	Anadromous	Not Specified	SPL Spawning location	092E15 15	U	(25-2, 01-JAN-1979)
SUCWOA RIVER	1	RB	Rainbow Trout	NOT SPECIF	Adfluvial	Augmented	SPM Major spawning location	092E15 13	U 092E15 12	D (26-14, no date)
SUCWOA RIVER	1	RB	Rainbow Trout	NOT SPECIF	Fluvial	Not Specified	OBL Fish observed at this point or zone	322117 W		(14-9, 01-JAN-1993)
SUCWOA RIVER	1	SK	Sockeye Salmon	NOT SPECIF	Anadromous	Not Specified	OBL Fish observed at this point or zone	322117 W		(25-2, 01-JAN-1979) (HQ1106, 01-FEB-1
SUCWOA RIVER	1	ST	Steelhead	NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this	322117 W		(STLHD-SUM, no d

SUCWOA RIVER	1	ST	Steelhead	WINTER Anadromous	Wild indigenous	point or zone OBL Fish observed at this point or zone	092E15 8	U	(25-15, 01-JAN-198
-----------------	---	----	-----------	-------------------	--------------------	---	----------	---	--------------------

[Download this information as a .csv file](#)[Top of Page](#)

APPENDIX 4 – DFO APPLICATION FORM

PROJECT NOTIFICATION AND REVIEW APPLICATION FORM

FOR DFO OFFICE USE ONLY

DFO Receive Date:

DFO Sub-Area Office:

Path #:

ADM:

To determine whether you should complete this form, follow the steps on DFO's Working Near Water website (www.pac.dfo-mpo.gc.ca/habitat/know-savoir-eng.htm). For instructions on how to complete and submit this form, refer to the Directions (www.pac.dfo-mpo.gc.ca/habitat/steps/praf/guide-eng.htm) or click on the number links on the left. Forms will not be processed unless all fields are properly completed as described in the directions.

Where additional information is provided in attached documents, you must include an appropriate summary in the space provided on the form. Please note that it is your responsibility to understand and comply with other jurisdictions and regulations applicable to your project.

Application Form Type (select only one type):

- 1 ☐ **Notification to DFO.** Please notify DFO 10 business days before starting your work. DFO does not typically respond to Notifications.
- or ☐ **Request for Project Review**
- or Have you attached "Additional Information to Support a Project Review"? ☐ Yes ☐ No
- ☒ **Request for a Fisheries Act Authorization?**
- Have you attached "Additional Information for a Fisheries Act Authorization"? ☒ Yes ☐ No
- Submission of this form serves as a Subsection 58(1) Schedule VI Fishery (General) Regulations application.

2 **Project Title:** Barge Ramp Relocation Project

Project Summary

- 3 Is this a "Building Canada" federally funded infrastructure project? ☐ Yes ☒ No
- Is the work or undertaking proposed in response to an emergency as defined by DFO? ☐ Yes ☒ No
- Does the project:
- Have any components within 30 m of the high water mark of a watercourse or water body? ☒ Yes ☐ No
 - Require removal of vegetation within 30 m of the high water mark of a watercourse or water body? ☐ Yes ☒ No
 - Have downstream impacts on water quality or water quantity? ☐ Yes ☒ No
- Does the project involve in-water works (below the high water mark)? ☒ Yes ☐ No

Contact Information for Proponent, Contractor and Consultant

- 4 Name of proponent: Stewart World Port Services Ltd. Province/Territory: British Columbia
- Contact name: Brad Moffat Postal code: V1J 6N2
- Mailing address: 11421 Alaska Rd. Tel no.: (250) 819-4341 Ext.
- Fax no.:
- City/Town: Fort St. John Email: bmoffat@stewartworldport.com
- Is the Proponent the primary contact for this project? ☐ Yes ☒ No

If no, please enter information for the primary contact in the space below:

Select type of additional contact:

☐ Contractor

☒ Consultant

Name of contractor/consultant:

Balanced Environmental Service

Province/Territory: British Columbia

Postal code: V7P 3H2

Contact name: Warren Appleton

Tel no.: (604) 988-3033

Ext.

Mailing address: 118 Garden Ave

Fax no.:

Email: warren@balanced.ca

City/Town: North Vancouver

Location of Proposed Development

5 DFO sub-area: 3-16

Name of nearest community: Stewart

Municipality or District: District of Stewart

Province/Territory: British Columbia

Address or legal description:

DL7318 Stewart, B.C.

Name of watershed: Portland Canal

Name of watercourse(s) or water body(ies) likely to be affected: Portland Canal beside mouth of Bear River

Map coordinates of the proposed development:

Latitude 55.917895 N or UTM zone ____ ; Easting ____ Northing
Longitude -129.99488 W

6 Brief directions to access the proposed project site: From Terrace, BC drive west to Kitwanga, drive north on highway 37 to the Meziadin Junction, turn left on Highway 37a, drive to the Stewart town site, and drive to the end of Railway St. to reach the existing Cassiar dock.

Other Permitting Processes

7 For projects proposed in British Columbia:

Have you made a submission under BC Water Act?

☐ Yes ☒ No

If yes, please indicate the type and provide the file number:

- ☐ Section 9 Notification - Tracking #:
☐ Section 9 Approval - Water File #:
☐ Water License - Water File #:

Does the British Columbia Riparian Areas Regulation apply to this project?

☐ Yes ☒ No

If yes, are you requesting a variance? File #:

☐ Yes ☐ No

For projects proposed in Yukon:

Have you submitted a project application to Yukon Environmental and Socio-Economic Assessment Board?

☐ Yes ☐ No

If yes, please provide the YESAB project number:

Description of the Aquatic Environment

8 What is the type of watercourse or water body that you plan to work in or near?

Freshwater:

- | | | |
|--|------------------------------------|----------------------------------|
| <input type="checkbox"/> Stream | <input type="checkbox"/> Lake | <input type="checkbox"/> Wetland |
| <input type="checkbox"/> River mainstem | <input type="checkbox"/> Pond | |
| <input type="checkbox"/> Active floodplain | <input type="checkbox"/> Reservoir | |

Coastal and Marine:

- | | | |
|--|-------------------------------|-----------------------------------|
| <input type="checkbox"/> Exposed coastline | <input type="checkbox"/> Cove | <input type="checkbox"/> Mud flat |
| <input type="checkbox"/> Salt marsh | <input type="checkbox"/> Bay | <input type="checkbox"/> Beach |

Other:

- ☒ Estuary

Description of the Aquatic Environment *(continued)*

- 9 Briefly describe the biological and physical characteristics of the proposed project site. *(List all information)*
(Channel width, type and flow, tides, water depth, substrate type and density, aquatic and riparian vegetation type and density)

Site is located on the Portland Canal between the Stewart Estuary and the Bear River at an active log dump. Substrate at the site is primarily pebble, with silt & sand becoming muddy towards west and riprap present around causeway. Visible biota density is low. Macro-algae is primarily limited to rockweed growing in the middle intertidal on large stable substrates. Diatoms are present in lower intertidal and crabs in the subtidal. Small patch of hairgrass growing on causeway aswell. No eelgrass, kelp or clams observed. Bear River is a known fish bearing watercourse. Locals state juvenile coho use estuary. See attached report.

- 10 Include representative photos of affected area and clearly mark the location of proposed activities.

Have you attached photos?

☒ Yes ☐ No

- 11 For freshwater, what fish species are known to be present at or near your project?

☐ Salmon (anadromous only) ☐ Other

- 12 Are any aquatic species likely present at the project site that are:

Listed under the federal Species at Risk Act?

☐ Yes ☒ No ☐ Uncertain

Designated under the British Columbia Wildlife Act?

☒ Yes ☐ No ☐ Uncertain

Listed under the Yukon Wildlife Act?

☐ Yes ☒ No ☐ Uncertain

If yes, list the species:

Bull Trout, Dolly Varden

Description of the Proposed Development

- 13 With which industry is your project associated?

- | | | |
|---|---|--|
| <input type="checkbox"/> Agriculture | <input checked="" type="checkbox"/> Industrial/commercial | <input type="checkbox"/> Power generation |
| <input type="checkbox"/> Aquaculture | <input type="checkbox"/> Military/security | <input type="checkbox"/> Private residential |
| <input type="checkbox"/> Commercial fishing | <input type="checkbox"/> Mining | <input type="checkbox"/> Transportation |
| <input type="checkbox"/> Conservation/restoration | <input type="checkbox"/> Oil and gas | <input type="checkbox"/> Urban and rural development |
| <input type="checkbox"/> Forestry | | |
| <input type="checkbox"/> Other: | | |

Description of the Proposed Development *(continued)*

- 14** What are you planning to do? Briefly describe all the project components you are proposing in or near water.

(max of 400 characters)

Have you considered and incorporated all options for redesigning and relocating your project to avoid negative impacts to fish and fish habitat?

☒ Yes ☐ No

If yes, include in description.

Relocate barge ramp facility by constructing causeway to deep water and installing piling and ramp.

- Footpring minimized
- Avoids filling Bear River
- Dredging not required
- Avoid estuary

- 15** How are you planning to do it? Briefly describe the construction materials, methods and equipment that you plan to use.

(max of 400 characters)

Have you considered and incorporated all best practices and mitigation measures recommended in relevant guidelines to avoid negative impacts to fish and fish habitat?

☒ Yes ☐ No

*If yes, include a description in **21***

Gravel and rip-rap extension of existing causeway by excavator, dump trucks, or other land based equipment. Pile driving rig used to install all steel piles - vibro if possible, impact if necessary.

- 16** Include a site plan (figure/drawing) showing all project components in and near water.

Are details attached?

☒ Yes ☐ No

- 17** Implementation schedule and proposed project timing:

What is the start and end date for the proposed project:

YYYY/MM/DD

2012/09/01

to

YYYY/MM/DD

2013/03/15

What is the schedule of all proposed work activities? (max of 500 characters)

Begin placing fill in fall 2012.

- 18** Will you follow the appropriate Timing Windows for all activities below the High Water mark?

☒ Yes ☐ No

If no, why not? (max of 300 characters)

Description of the Proposed Development *(continued)*

- 19 Indicate the extent of the area (in square metres) that your project will affect in and/or near water. Identify if areas would be temporarily and/or permanently affected. *(limit of 100 characters)*

See attached Habitat Balance Sheet.

- 20 Will you be withdrawing or discharging water?

☐ Yes ☒ No

If so, identify your water source and describe the volume and rates. (limit of 400 characters)

Description of the Proposed Fish and Fish Habitat Protection Measures

- 21 Outline all the measures and practices that you will apply to avoid and/or minimize impacts to the aquatic environment. List appropriate Operational Statements and/or Best Management Practices. *(limit of 999 characters)*

- Follow BMPs for Pile Driving (BC Marine and Pile Driving Contractors Association)
- Vibratory hammer used if driving conditions permit
- Bubble curtain used as required
- Contractor to have spill management plan in place, including spill kit
- Infill placed during periods of low tide
- Heavy equipment to be kept out of water
- Heavy equipment operate within project footprint only
- No grounding of barges or equipment on foreshore
- Environmental monitoring as required
- Minimize filling during extreme rainfall events
- Cover any storage areas
- Do not leave pile tops uncovered
- Inspect equipment to ensure in good working order, clean and free of leaks

- 22 I, Warren Appleton (print name) certify that the information given on this form is to the best of my knowledge correct and completed.

2012/07/11

Date (YYYY/MM/DD)

Information about the above-noted proposed work or undertaking is collected by DFO under the authority of the *Fisheries Act* for the purpose of administering the fish habitat protection provisions of the *Fisheries Act*. Personal information will be protected under the provisions of the *Privacy Act* and will be stored in the Personal Information Bank number DFO PPU 080. Under the provisions of the *Privacy Act*, individuals have a right to, and on request shall be given access to any personal information about them contained in a personal information bank. Instructions for obtaining personal information are contained in the Government of Canada's Info Source publications available at www.infosource.gc.ca or in Government of Canada offices. Information other than "personal" information may be accessible or protected as required by the provision of the *Access to Information Act*.

BALANCED ENVIRONMENTAL

July 11, 2012

Balanced File No.: 5397-R-02.1

Brad Moffat c/o
Arctic Construction
11421 Alaska Road
Fort St. John, B.C.
V1J 6N2

**Re: *Biophysical Survey Results for Barge Ramp Relocation Project,
Stewart, British Columbia***

Brad,

As you are aware, Balanced Environmental Services Inc. (Balanced) was contracted by Arctic Construction Ltd. (ACL) to collect baseline biophysical information in support of reactivating a barge ramp at the existing Cassiar dock in Stewart, British Columbia (see Drawing 5397-D-01.2 – Location Map). The biophysical information will be used to assess the impacts of the proposed project and to initiate discussions with Fisheries and Oceans Canada (DFO), which will likely lead to a *Fisheries Act* Authorization for the project.

On May 1 and 2, 2012, Balanced performed field visits to collect the biophysical information, which included above and below water surveys. The above water survey was conducted by a team of biologists (Warren Appleton, Duncan Clark, and Kurt Fehr) and included a general survey of the area from above the high water mark to the low tide at the time of survey (2.0m chart datum). Biophysical information was collected using a dGPS and a Total Station, which was also used to collect topographic data.

The below water survey was conducted by a team of WorkSafeBC certified SCUBA divers and involved making general observations on species presence and abundance, as well as mapping the transitions between different substrate types relative to local infrastructure. A hydrographic survey using a Digital Depth Sounder and dGPS was also performed.

Biophysical, bathymetric, and topographic information collected during the field visits are available on the attached Balanced drawings 5397-D-01.1 (Location Map), 5397-D-02.1 (Biophysical Conditions), and the attached File No. 5397-E-01.1 (Table 1 – Observed Biota) and are summarized below. All elevations are in metres and related to chart datum via the Stewart Harmonic Station (CHS) using Tides and Currents Pro v. 3.5.107.

Substrate Conditions – See Drawing 5397-D-02.2

The existing causeway is a disturbed site primarily consisting of gravel and deteriorating asphalt with some areas of shallow soil within the vicinity of the tank farm containment area at the north end of the survey area. The edge of the causeway consists of a riprap armoured slope with angular rock ranging from 64mm to 700mm in diameter, with the majority of rock being less than 300mm in diameter. The riprap slope runs from the top of bank (7.4 to 7.8 metres chart datum) to an elevation of 3.0m chart datum. At the toe of the riprap slope the substrate transitions to mud with sparse woody debris on the west side of the causeway and to primarily pebble substrate with patches of sand and cobble on the south of the causeway. The mud substrate extends south to an approximate elevation of 1.0m chart datum where it transitions to pebble, which continues to subtidal depths. A short riprap berm separates a boat launch ramp from the neighbouring Bear River.

BALANCED

Biological Conditions – See Attached Files 5397-D-02.2 and 5397-E-01.2

The majority of upland asphalt and gravel habitat was devoid of any vegetation. A narrow 1 to 2 metre fringe of vegetation was present along the top of the riprap slope which consisted of grasses and sparse Willow (*Salix sp.*) and Sitka Alder (*Alnus crispa ssp. sinuata*) shrubs. A greater variety of vegetation was present at the north end of the survey area within the vicinity of the tank farm containment area, including some trees (Cottonwood, Hemlock, and Sitka Spruce). Dunegrass (*Elymus mollis*) and Tufted Hairgrass (*Deschampsia cespitosa*) were patchily distributed amongst the riprap at the northwest end of the survey area. Aquatic vegetation was limited to Rockweed (*Fucus sp.*) and Green Alga (*Ulva intestinalis*) which was most abundant on the riprap substrate. Colonial Diatoms and Green Alga were also observed at less than 25% coverage on intertidal pebble. Observed invertebrate species included Tanner Crabs (*Chionoecetes bairdi*) on subtidal pebble and unidentified shrimp within the intertidal mud habitat. No critical habitat organisms were visible such as Eelgrass (*Zostera marina*), Kelp (*Laminarians*), Pickleweed (*Salicornia spp.*) or Sedges (*Carex spp.*). Overall, colonization by visible organisms was sparse.

No finfish were observed during the biophysical survey. Visibility during the biophysical survey varied from 0.3m above the low water mark to 3 metres below the low water mark.

A review of the online Fish Information Summary System database on June 7, 2012 (attached) stated that the following fish have been observed in the Bear River: Dolly Varden, Steelhead, Sculpins, Chinook Salmon, Chum Salmon, Coho Salmon, Sockeye Salmon, Pink Salmon, Lamprey, Longnose Dance, Mountain Whitefish, Rainbow Trout, and Chub. However, local knowledge suggests that the area is primarily Coho habitat.

No species at risk were observed during the biophysical survey.

Impact Areas – See Drawing 5397-D-05.1

The proposed relocation of the barge ramp is shown on drawings #12039-1. The existing barge ramp location has become filled in with aggregate from the Bear River and cannot be used. The proposed new location will allow barges to offload at all tide levels without grounding on the foreshore. The impacts to Fish and Fish Habitat from this work relate to the net loss of intertidal substrate and water column from the fill area.

The fill area has a **footprint of approximately 12,470m²** of which 6,279 m² will be raised above the high water mark (7.6m chart datum). The fill area will cover an existing riprap slope with is approximately 50% rockweed (on the lower half) and 50% bare riprap (on the upper half). Beyond the riprap, half of the area filled is pebble substrate with patches of sand and cobble and is located in an area formally used for barge loading/unloading. This area is primarily bare with less than 25% coverage of diatoms (*Bacillariophyceae*). To the east, the substrate under the proposed fill area transitions to mud at the active booming ground. Mud substrate cover represents less than a 10th of the fill area. This area is currently covered by log booms that ground out during periods of low tide and is devoid of any visible organisms. According to a local, the area has been reworked by logging operations and should be pebble very near the surface. Minor amounts of woody debris are present.

Post construction, the causeway will have a riprap slope surrounding the facility. The riprap area within the growing range of Rockweed (2.3m to 4.4m) is expected to be over 3 times as large as that of the existing causeway. The fill area is expected to result in a loss of water column of approximately 70,000 cu.m of water column. A complete description of the fill area impacts are described below in the Habitat Balance Sheet.

BALANCED

Table 1. Habitat Balance Sheet for Fill Area Permanent Impacts

Zones	Location	Elevation	Substrate	Biota	Pre	Post	Net
A	Booming Grounds	Subtidal	Pebble	Crabs	655	0	-655
B	Old Ramp Area	Intertidal	Pebble	Diatoms	9214	0	-9214
C	Booming Grounds	Intertidal	Mud	Unvegetated	1078	0	-1078
D	Causeway	Intertidal	Riprap	Rockweed	838	3408	2570
E	Causeway	Intertidal	Riprap	Unvegetated	685	2783	2098
Total					12470	6191	-6279

All areas are in square metres.

The barge ramp has an area of 337 m². There are no photosynthetic organisms within the footprint of these structures. The substrate is entirely subtidal and consists of pebble. See the attached species list for a complete list of subtidal species observed.

Summary and Moving Forward

As the project requires a significant amount of fill within marine waters, even though no critical habitat will be lost, we expect that this project will require Authorization pursuant to the *Fisheries Act*. A meeting with Fisheries and Oceans Canada is proposed to present the project and initiate the project review process necessary to secure a *Fisheries Act* Authorization and determine whether any further mitigation is required.

Sincerely,
BALANCED ENVIRONMENTAL SERVICES INC.



Warren Appleton, RPBio
Project Biologist

WA/xie
attachment

TABLE 1

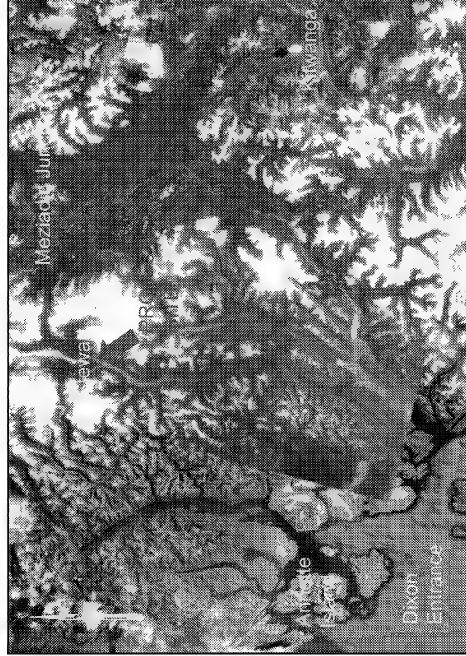
OBSERVED BIOTA
BARGE RAMP RELOCATION PROJECT
STEWART, BRITISH COLUMBIA

Date of survey: May 1 and 2, 2012

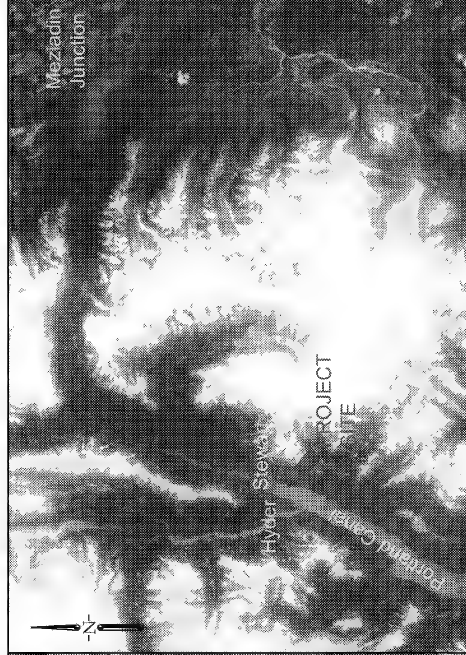
Common Name	Scientific Name	Chart Datum Range (m)		Abundance*	
		Upper	Lower	Description	Method
Barnacles					
Acorn	<i>Balanus glandula</i>	1.0	<-20.0	Common	PAC
Brown Alga					
Rockweed	<i>Fucus gardneri</i>	4.4	2.3	Common	PAC
Crabs					
Tanner	<i>Chionoecetes bairdi</i>	1.0	<-20.0	Sparse	IOT
Diatoms					
Colonial	<i>Class: Bacillariophyceae</i>	2.5	0.0	Sparse	PAC
Green Alga					
Green String Lettuce	<i>Ulva intestinalis</i>	5.0	2.0	Few	PAC
Marsh Plants					
Dunegrass	<i>Elymus mollis</i>	7.5	6.0	Rare	PAC
Seaside Plantain	<i>Plantago maritima</i>	4.4	4.4	Rare	PAC
Tufted Hairgrass	<i>Deschampsia cespitosa</i>	6.0	4.4	Rare	PAC
Riparian Plants					
Black Cottonwood	<i>P. balsamifera ssp. trichocarpa</i>	>7.5	>7.5	Rare	PAC
Blueberry	<i>Vaccinium sp.</i>	>7.5	>7.5	Rare	PAC
Grass	<i>Various spp.</i>	>7.5	>7.5	Sparse	PAC
Salal	<i>Gaultheria shallon</i>	>7.5	>7.5	Rare	PAC
Scouring-rush	<i>Equisetum hyemale</i>	>7.5	>7.5	Rare	PAC
Sitka Alder	<i>A. crispa ssp. sinuata</i>	>7.5	>7.5	Sparse	PAC
Sitka Spruce	<i>Picea sitchensis</i>	>7.5	>7.5	Rare	PAC
Western Hemlock	<i>Tsuga heterophylla</i>	>7.5	>7.5	Rare	PAC
Willow	<i>Salix sp.</i>	>7.5	>7.5	Sparse	PAC
Thimbleberry	<i>Rubus parviflorus</i>	>7.5	>7.5	Rare	PAC

*PAC = Percent Aerial Coverage, IOT = Individuals on Transects

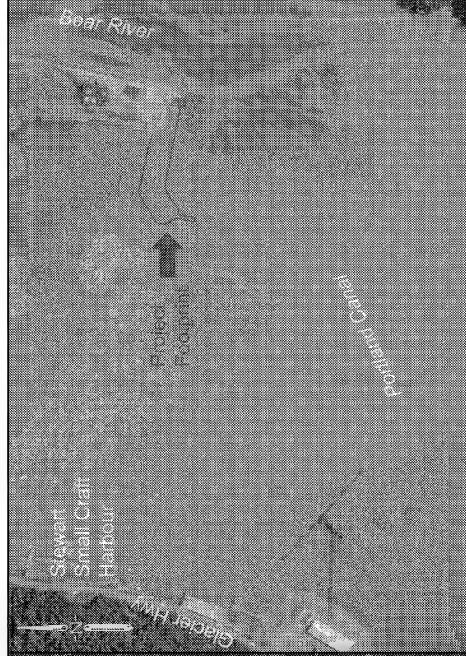
*Abundance Category	Percent Aerial Coverage (PAC)	Individuals on Transects or Tracklines (IOT)	Individuals per Square Metre (IPM)
Rare	<5%	1	1
Sparse	5-25%	2-4	2-4
Few	26-50%	5-10	5-10
Common	51-75%	11-30	11-30
Abundant	>75%	>30	>30



LOCATION CHART 1 : 2,000,000



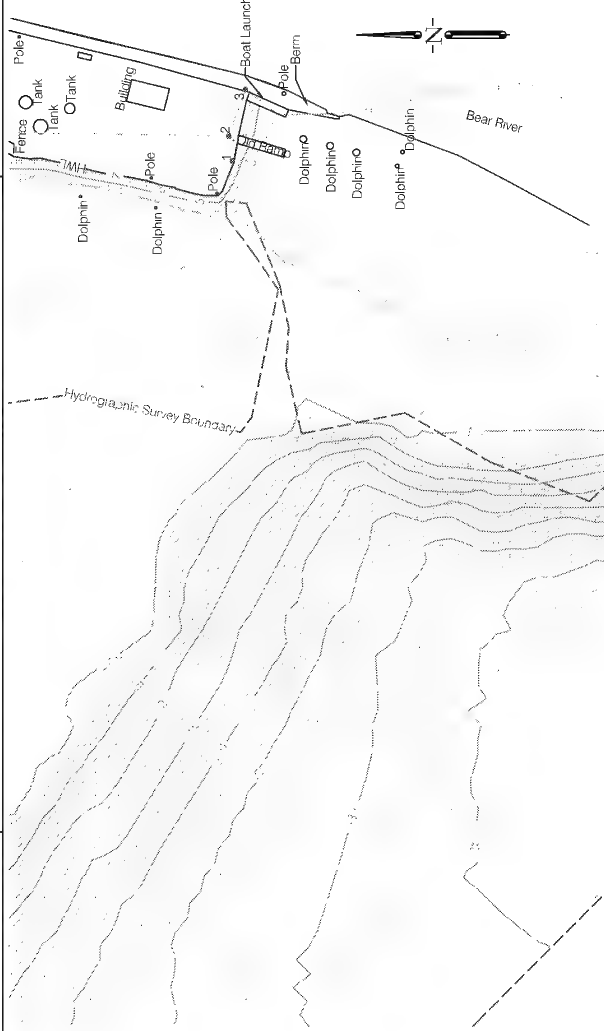
LOCATION CHART 1 : 500,000



LOCATION CHART 1 : 10,000

DRAWING NOTES

- Drawing notes apply to Drawings 5397-D-01.1 and 5397-D-02.1.
- Not an As-Built drawing.
- All elevations are in metres and related to chart datum via the Stewart Harmonic Station (CHS) Tides and Currents Pro v. 3.5.107 accurate to $\pm 0.3m$.
- Hydrographic, topographic and biophysical surveys were conducted on May 1 and 2, 2012.
- Intertidal biophysical location information was collected using either a total station or dGPS.
- General underwater biophysical information was collected by making a series of dives throughout the survey area. Observations were located relative to existing structures onsite.
- The information, including elevation and biophysical data, presented on the drawings may vary from current conditions due to the passage of time or seasonal changes in substrate and biota.
- The data presented on the drawings represents, in general terms, the substrate and biota types.
- Contour data between the limits of the hydrographic and topographic surveys is extrapolated.
- According to Cambria Gordon 2011, the high water mark for the site is approximately 7.67m chart datum.
- To convert to Geodetic, subtract 3.713 metres.

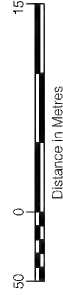


LEGEND

- Existing Structures
- 1.0m Contour
- 5.0m Contour
- Low Water (LWL) (0m Chart Datum)
- High Water (HWL) (7.67m Contour)
- Hydrographic Survey Boundary
- Topographic Survey Boundary
- Survey Reference Point

SURVEY REFERENCE POINTS

- Reference Point 1
 - Canada Hydrographic Services # 85 79600
 - Tide & Currents: 7.84m Chart Datum
- Reference Point 2
 - Observation Monitoring Well
- Reference Point 3
 - Tide Program: 7.84m Chart Datum
 - BC Legal Survey Monument #2002 SL 7318 WT 4.446 509
 - Tides & Currents: 6.99m Chart Datum



Client		Author		PROJECT	
ARCTIC CONSTRUCTION		WA		LOCATION MAP	
11421 Alaska Road		DC		BARGE RAMP RELOCATION PROJECT,	
Fort St. John, BC		Date		STEWART, BRITISH COLUMBIA	
V1J 6N2		July 11, 2012			
		Scale			
		1:3500			
		Inspectors			
		WA, DC, KF			
		Paper			
		11 x 17			
				DWG. No.	
				5397-D-01.2	



Photo 1. A narrow fringe of grasses and shrubs was present along the top of the causeway's riprap slope.



Photo 2. Green algae and rockweed were common on the riprap east of the Bear River.



Photo 3. View of riprap slope, berm, and pebble intertidal zone south of the causeway and boat launch.

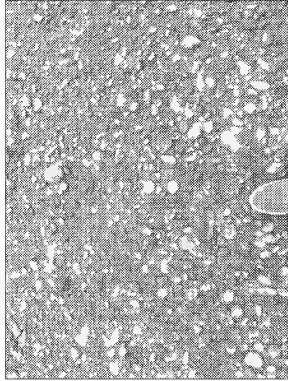


Photo 4. Close-up of intertidal pebble with less than 25% coverage of green algae and diatoms.

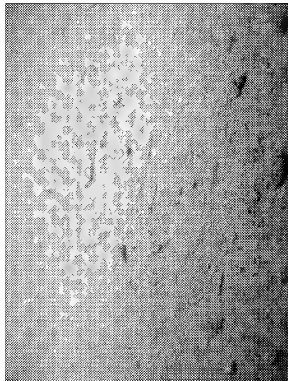


Photo 5. Close-up of intertidal mud substrate.

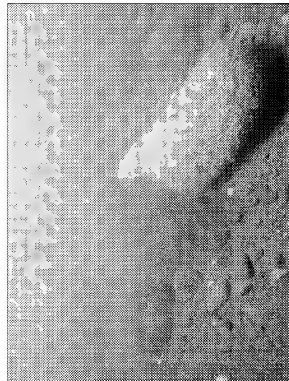
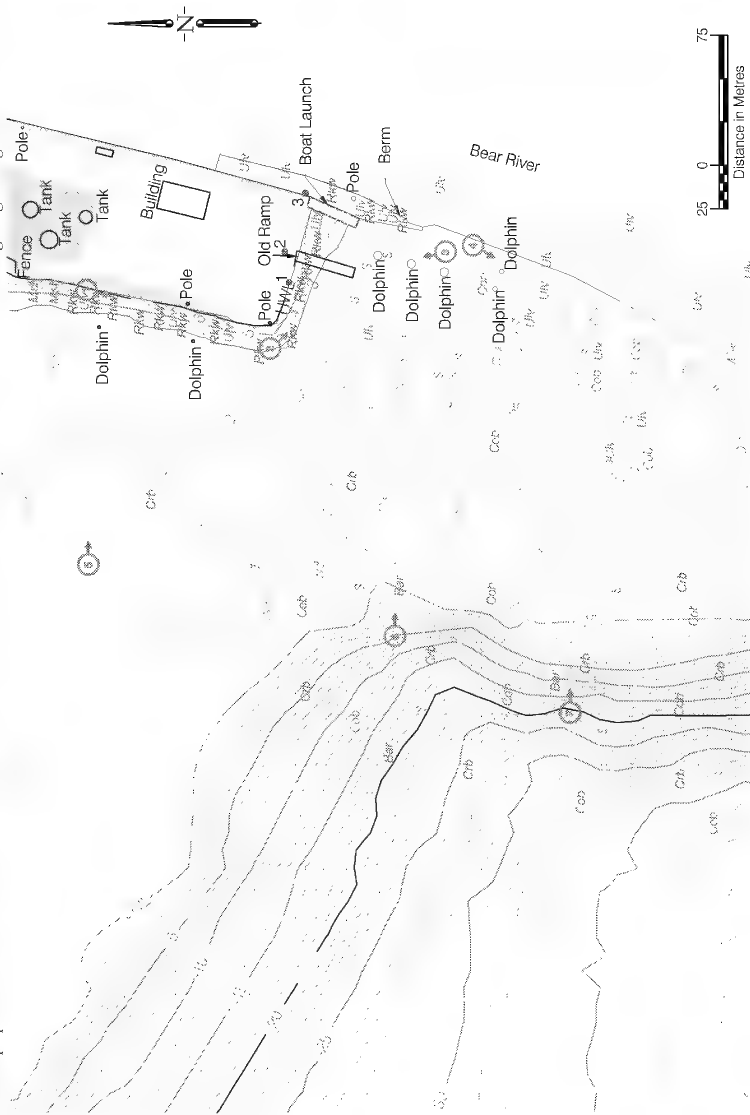


Photo 6. Barnacle spat and diatoms were observed on cobble substrate near the low water line. Pebble substrate was typically bare.



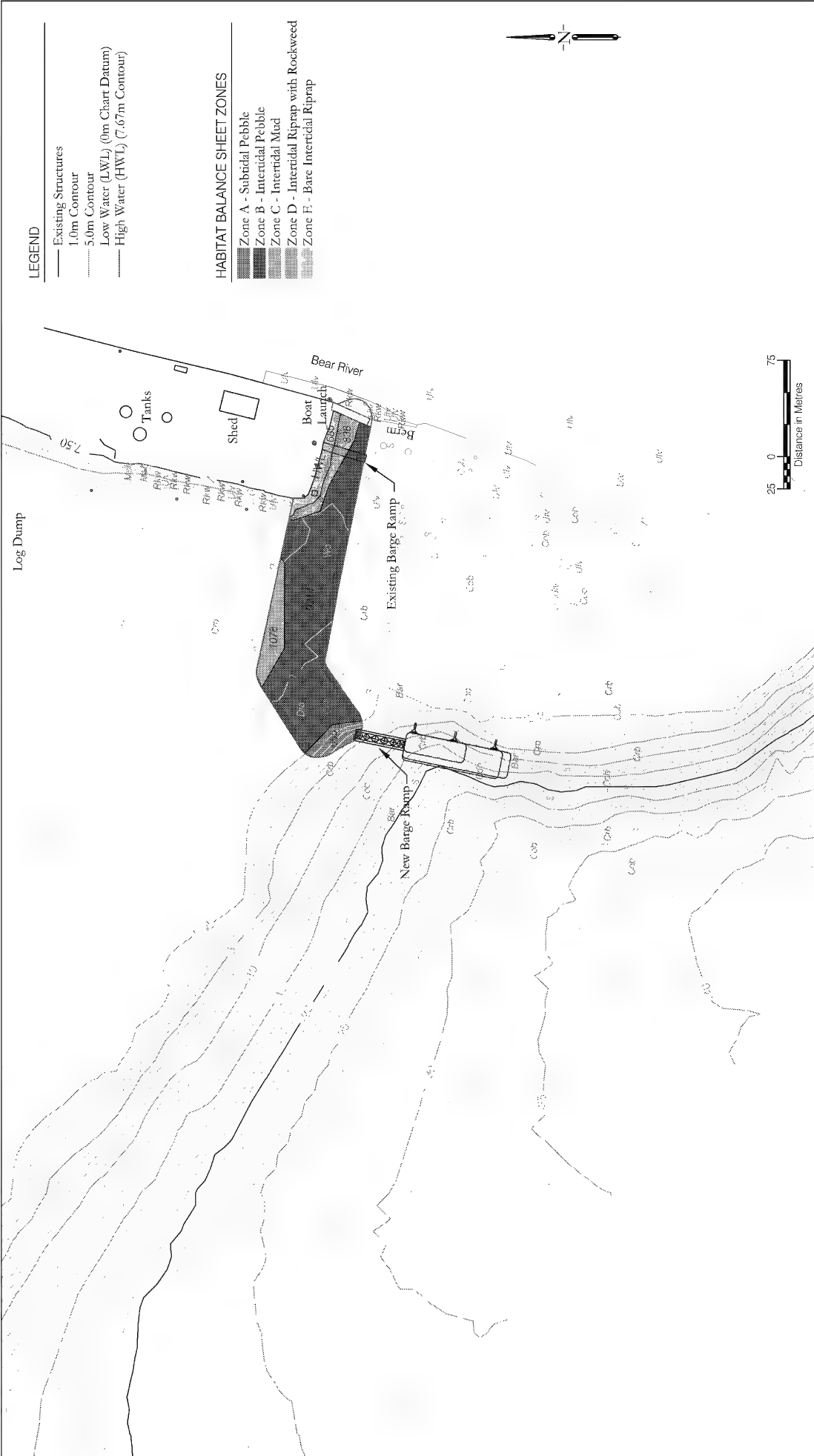
Photo 7. Tanner crab on subtidal pebble substrate with silty sand.



DRAWING NOTES

- For a complete list of drawing notes, see Drawing 5397-D-01.1 - Location Map.
- Intertidal biophysical information was collected using a total station or dGPS.
- General underwater biophysical information was collected by making a series of dives throughout the survey area. Observations were located relative to existing structures onsite.
- The information, including elevation and biophysical data, presented on the drawings may vary from current conditions due to the passage of time or seasonal changes in substrate and biota.
- The data presented on the drawings represents, in general terms, the substrate and biota types.

Ref. No.	REFERENCE	Client	Author	PROJECT				DWG. No.	5397-D-02.2
				Checked by	WA	DC	Drawn by		
		ARCTIC CONSTRUCTION 11421 Alaska Road Fort St. John, BC V1J 6N2	BALANCED ENVIRONMENTAL	Date	July 11, 2012				
				Scale	1:2500				
				Inspectors	WAKF/DC				
				Paper	11 x 17				



Ref. No.	REFERENCE	Client	ARCTIC CONSTRUCTION 11421 Alaska Road Fort St. John, BC V1J 6N2	Author	BALANCED ENVIRONMENTAL	Checked by		PROJECT	
						XIE		IMPACT AREAS,	
						WA		BARGE RAMP RELOCATION PROJECT,	
						Date		JULY 11, 2012	
						Scale		1:2500	
Ref. No.	REFERENCE	Client	ARCTIC CONSTRUCTION 11421 Alaska Road Fort St. John, BC V1J 6N2	Author	BALANCED ENVIRONMENTAL	Inspectors		DWG. No.	
						WAKF-DC		5397-D-05.1	
						Paper		11 x 17	

Pages 75 to / à 78
are duplicates
sont des duplicatas

ALL-SPAN
ENGINEERING & CONSTRUCTION LTD.

#207 - 7198 VANIAGO WAY
DELTA, B.C. CANADA V4D 1K7
F: 604-940-5166
E: info@all-span-engineering.com
P: 604-940-2727 FAX: (604) 940-516

CAD FILE: 10039-1

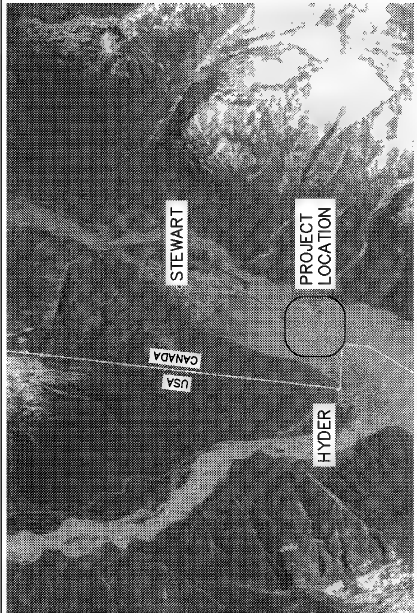
CLIENT
STEWART WORLD PORT

PROJECT
STEWART BARGE RAMP

DRAWING TITLE
KEY PLAN AND SITE PLANS

REV	DESCRIPTION	DATE	BY	DRAWING NO	PROJECT NO	REV
A						1
B						
C						
D						
E						
F						
G						
H						
I						
J						
K						
L						
M						
N						
O						
P						
Q						
R						
S						
T						
U						
V						
W						
X						
Y						
Z						

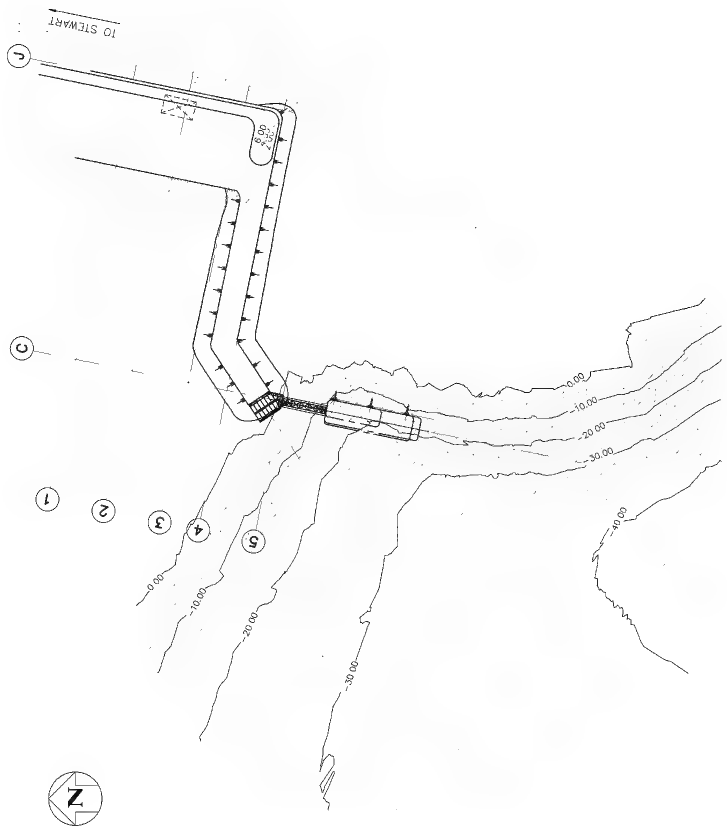
DATE: 3/04/12
SCALE: AS NOTED
J.P.
DRAWN BY: J.P.
CHECKED BY: D.M.
APPROVED: PROJECT NO. 2039
DRAWING NO. 1



KEY PLAN
NTS

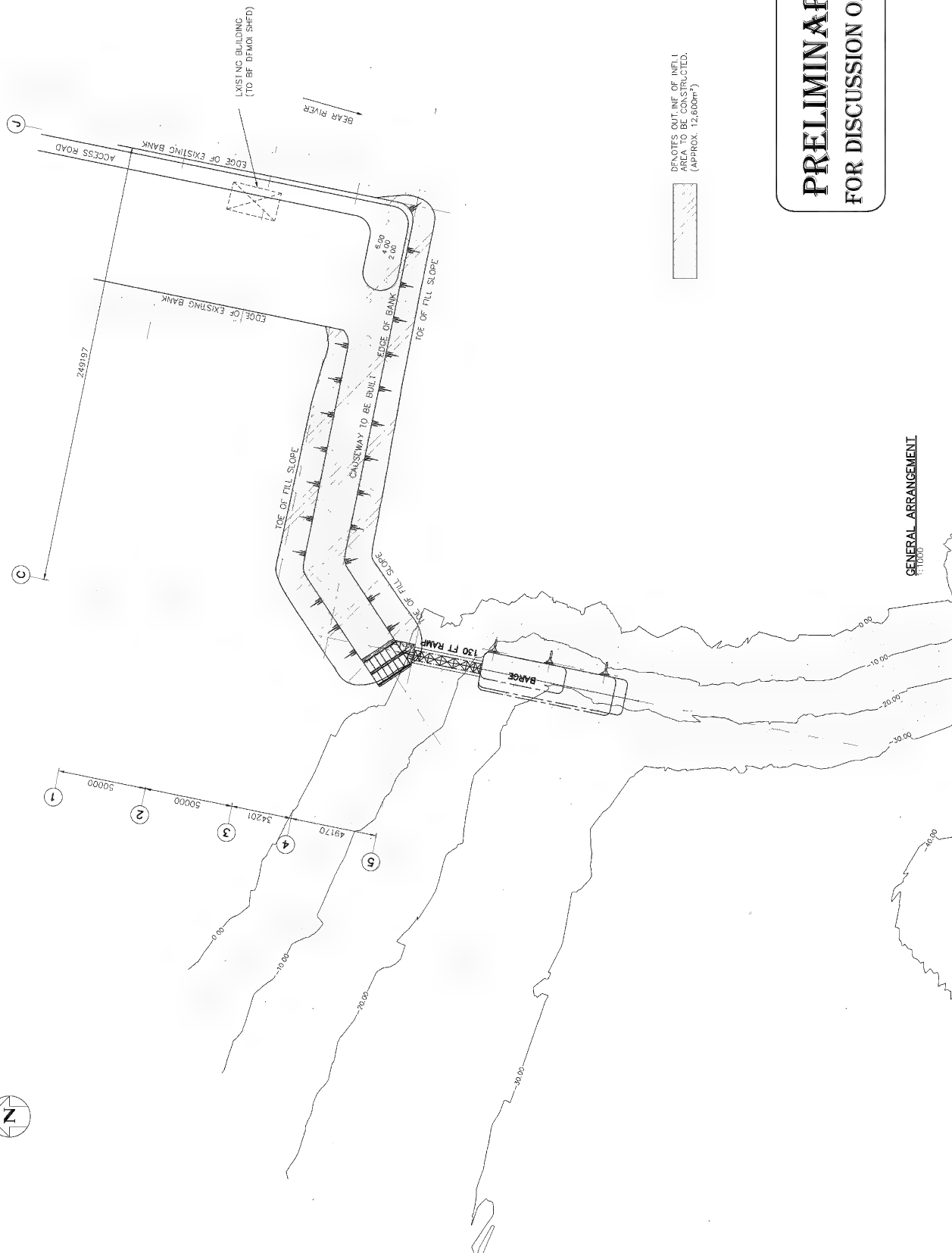


**PRELIMINARY
FOR DISCUSSION ONLY**

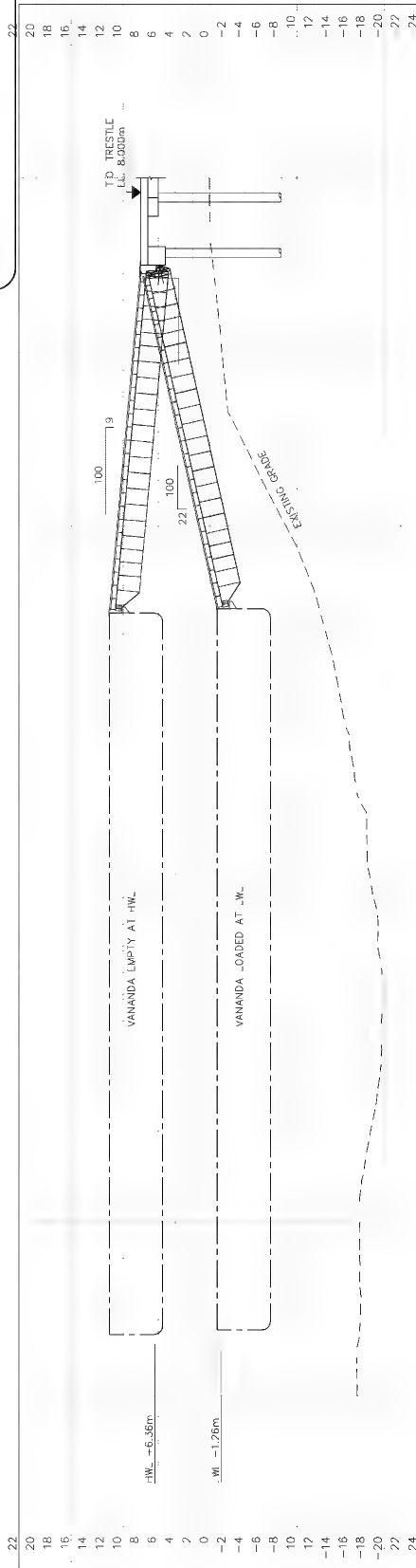


SITE PLAN
1:2000


5	SCALE	DRAWN BY	J.P.	AS NOTED
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				
33				
34				
35				
36				
37				
38				
39				
40				
41				
42				
43				
44				
45				
46				
47				
48				
49				
50				
51				
52				
53				
54				
55				
56				
57				
58				
59				
60				
61				
62				
63				
64				
65				
66				
67				
68				
69				
70				
71				
72				
73				
74				
75				
76				
77				
78				
79				
80				
81				
82				
83				
84				
85				
86				
87				
88				
89				
90				
91				
92				
93				
94				
95				
96				
97				
98				
99				
100				
101				
102				
103				
104				
105				
106				
107				
108				
109				
110				
111				
112				
113				
114				
115				
116				
117				
118				
119				
120				

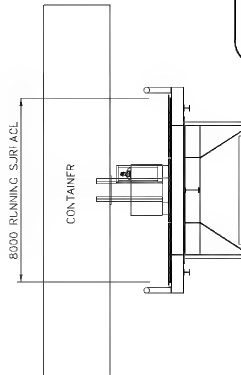
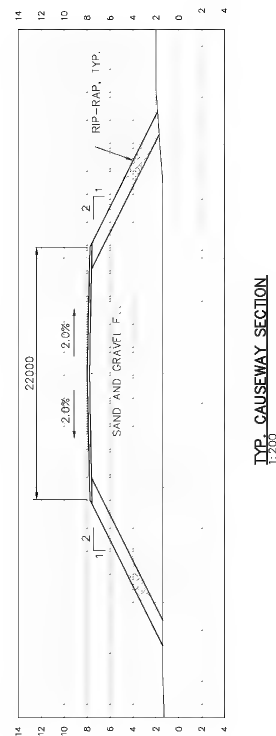
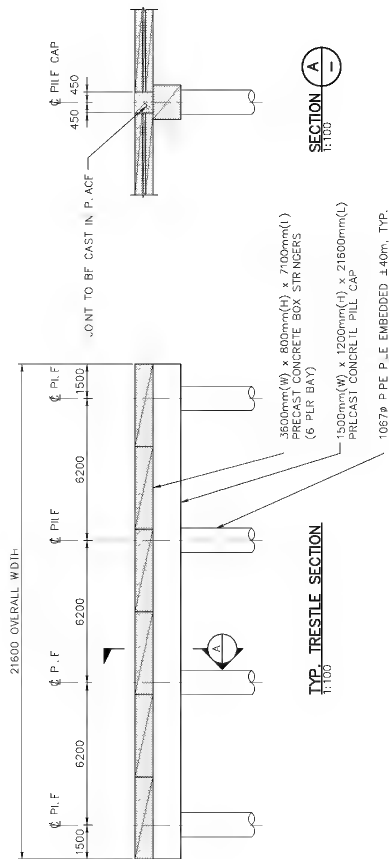
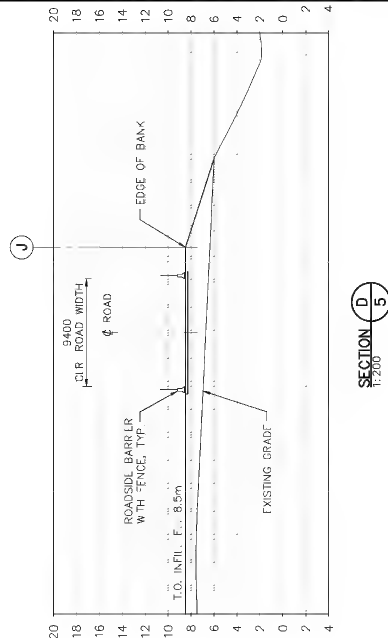


STEWART WORLD PORT	PROJECT	STEWART BARGE RAMP	RAMP & BARGE PLAN & PROFILE
1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24
25	26	27	28
29	30	31	32
33	34	35	36
37	38	39	40
41	42	43	44
45	46	47	48
49	50	51	52
53	54	55	56
57	58	59	60
61	62	63	64
65	66	67	68
69	70	71	72
73	74	75	76
77	78	79	80
81	82	83	84
85	86	87	88
89	90	91	92
93	94	95	96
97	98	99	100
101	102	103	104
105	106	107	108
109	110	111	112
113	114	115	116
117	118	119	120
121	122	123	124
125	126	127	128
129	130	131	132
133	134	135	136
137	138	139	140
141	142	143	144
145	146	147	148
149	150	151	152
153	154	155	156
157	158	159	160
161	162	163	164
165	166	167	168
169	170	171	172
173	174	175	176
177	178	179	180
181	182	183	184
185	186	187	188
189	190	191	192
193	194	195	196
197	198	199	200
201	202	203	204
205	206	207	208
209	210	211	212
213	214	215	216
217	218	219	220
221	222	223	224
225	226	227	228
229	230	231	232
233	234	235	236
237	238	239	240
241	242	243	244
245	246	247	248
249	250	251	252
253	254	255	256
257	258	259	260
261	262	263	264
265	266	267	268
269	270	271	272
273	274	275	276
277	278	279	280
281	282	283	284
285	286	287	288
289	290	291	292
293	294	295	296
297	298	299	300
301	302	303	304
305	306	307	308
309	310	311	312
313	314	315	316
317	318	319	320
321	322	323	324
325	326	327	328
329	330	331	332
333	334	335	336
337	338	339	340
341	342	343	344
345	346	347	348
349	350	351	352
353	354	355	356
357	358	359	360
361	362	363	364
365	366	367	368
369	370	371	372
373	374	375	376
377	378	379	380
381	382	383	384
385	3		



PROFILE ALONG GRIDLINE C
1:250

		ENGINEERING & CONSTRUCTION LTD. #27 - 7198 VANIAG WAY DELTA B.C. CANADA V4C 1K7 F. 604-940-5161 E. info@all-span.ca P. 604-940-2727 FAX. 604-940-5161	
CLIENT STEWART WORLD PORT PROJECT STEWART BARGE RAMP MISC. DETAILS		DRAWING NO. - 118 REV.	
DATE	SCALE	AS NOTED	UP
DRAWN BY	SCALE	AS NOTED	UP
DESIGN BY	SCALE	AS NOTED	UP
DESIGN BY	SCALE	AS NOTED	UP
CHKD BY	SCALE	AS NOTED	UP
APPROVAL	SCALE	AS NOTED	UP
PROJECT NO.	SCALE	AS NOTED	UP
DATE	SCALE	AS NOTED	UP
DESCRIPTION	SCALE	AS NOTED	UP
REV.	SCALE	AS NOTED	UP



PRELIMINARY
FOR DISCUSSION ONLY

TYP. RAMP SECTION
1:100



Ted Pickell, Chief Executive Officer
Stewart World Port
11421 Alaska Road
Fort St John BC V1J 6N2

Reference: 204277

tp@stewartworldport.com

Dear Ted Pickell:

Re: Northwest Port Development

The Province recognizes this is a time of unprecedented demand for British Columbia resources from global markets, and as articulated in the ministry's recently released *Pacific Gateway Transportation Strategy 2012-2020*, the provincial government and its partners see an opportunity for a greater than 300 per cent increase in trade volume for metals and minerals by 2020, with much of the growth taking place in the Northwest.

To capitalize on this demand, the Province is investing in projects such as the Northwest Transmission Line, which enables the future development of a significant number of mines in northwestern B.C. Our analysis supports the need for additional terminal capacity to accommodate increasing production of mineral concentrate in the region.

The provincial government is supportive of developing infrastructure of the nature being proposed by Stewart World Port at the Port of Stewart.

Sincerely,

Dave Byng
Chief Operating Officer

Ministry of Transportation
and Infrastructure

Office of the
Chief Operating Officer

Mailing Address:
PO Box 9850 Stn Prov Govt
Victoria BC V8W 9T5
Telephone: 250 387-7671
Fax: 250 387-6431

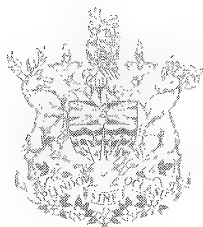
Location:
5B 940 Blanshard Street
Victoria BC V8W 3E6
www.gov.bc.ca/tran

Legislative Office:

East Annex, Parliament Buildings
Victoria, B.C. V8V 1X4
Phone: 250 952-6784
Fax: 250 387-9100
e-mail: pat.pimm.mla@leg.bc.ca

Constituency Office:

10104 - 100th Street
Fort St. John, B.C. V1J 3Y7
Phone: 250 263-0101
Fax: 250 263-0104
website: www.patpimmmla.bc.ca



**Province of
British Columbia**

Legislative Assembly



Pat Pimm, M.L.A.
Peace River North
Parliamentary Secretary
for Natural Gas Initiative

May 30, 2012

To Whom it May Concern:

Re: Arctic Construction Ltd. – Ted Pickell, CEO

Please consider this letter as my formal support for Ted Pickell and Arctic Construction Ltd. for their proposed deep sea dock project at the port in Stewart, BC.

I have had the opportunity to discuss the proposed project with him. This project is to build a dock with the capability of loading and unloading ocean-going vessels, carrying 70-80,000 ton loads. The location of this project is very strategic as Northern BC ports are typically 1 ½ -2 days closer to Asian ports. There is no port north of Vancouver capable of handling this type of load, and no dock to accommodate these types of ships.

I am convinced that this project will be an excellent addition to the province as the mining industry in BC continues to grow. The need for additional port capacity, with the ability to receive and export concentrates will become even more important. A project of this magnitude will help drive the economy and create good paying jobs for British Columbian families for years to come.

Sincerely,

Pat Pimm, MLA
Peace River North



DISTRICT OF STEWART

COPY

Office of the Mayor

June 5, 2012

Fisheries and Oceans Canada
Suite 200 - 401 Burrard Street
Vancouver, British Columbia V6C 3S4

Re: Stewart World Port

As Mayor of the District of Stewart, I am writing to endorse Stewart World Port Services Ltd.'s intent to construct and operate a multi-purpose port facility in Stewart, British Columbia.

Located at the end of the Portland Canal, Stewart is a natural deep sea port with works that include Stewart Bulk Terminals and a bulk log handling facility. Stewart's hinterland is one of the richest mineral regions in North America, and additional port facilities will be required to support the mining industry with outbound mineral concentrates and inbound mine supply.

Stewart World Port Services multi-purpose port is well aligned with the District of Stewart's "Investment - Ready Community Profile", provides economic investment and growth for the region, and adds much needed transportation capacity for the mining sector in Northwest British Columbia.

Sincerely,

Galina Durant
Mayor

APPENDIX 5 – PILE DRIVING BMP'S

Best Management Practices for Pile Driving and Related Operations – BC Marine and Pile Driving Contractors Association - March, 2003

The BC Marine and Pile Driving Contractors Association and Fisheries and Oceans Canada (DFO) have developed a Best Management Practices Policy for pile driving operations and related activities when working on the water within the province of British Columbia.

The Pile Driving Industry utilizes many different construction methods, equipment and materials in order to complete the contractual obligations for its client. Hammers; including drop, diesel, air, vibratory and hydraulic, vibroflot, and rotary, air and churn drills are the primary instruments in a pile driving operation. These hammers and drills are supported by a wide variety of heavy equipment, including a range of conventional cranes (truck mounted, crawler and pedestal mounted), spud scows, support barges and other water borne equipment. The piling types include treated timber (primarily creosote), concrete and steel (pipe, h-beam and sheet). Construction projects have the potential to utilize a number of different combinations of equipment and materials. It is the purpose of this document to examine the characteristics of each potential combination and develop a Best Management Practices Policy that will meet the following criteria:

- Maximize environmental protection
- Avoid contravention of the Fisheries Act
- Provide construction services economically

1)- Basic Rules of Operation

When in an aquatic environment, contractors will employ the following BASIC Best Management Practices:

- All equipment will be maintained in good proper running order to prevent leaking or spilling of potentially hazardous or toxic products. This includes hydraulic fluid, diesel, gasoline and other petroleum products.
- Storage of fuels and petroleum products will comply with safe operating procedures, including containment facilities in case of a spill.
- Pile cut-offs, waste or any miscellaneous unused materials will be recovered for either disposal in a designated facility or placed in storage. Under no circumstances will materials be deliberately thrown overboard.
- Contractors will have emergency spill equipment available whenever working near or on the water.
- Contractors, where possible, will position their water borne equipment in a manner that will minimize damage to identified fish habitat (i.e. eelgrass). Where possible, alternative methods will be employed (i.e.: use of anchors instead of spuds). In the event that circumstances will not allow an alternative, contractors will minimize the

damage and where required restore habitat to its original state at the completion of the project.

- Prior to the commencement of any work, the contractor will complete and forward the attached “Notice of Project” to the Department of Fisheries and Oceans. Letters of advice or Habitat Authorizations may be required, depending on the scope of work proposed.
- If contractors are working and a herring (or other fish) spawning occurs, the work will be temporarily suspended and the appropriate DFO contact notified.
- There will be no restriction of work during closure periods (the only exception being when spawning is present), provided the contractors employ an exclusion device (protective netting or geotextile material suspended in the water column around pile driving area) around the work area to prevent fish access or when required, an effective method of mitigating shock waves (bubble curtain).
- Whenever shock wave monitoring (hydrophone) is performed at a marine construction site and the findings are available to the contractor, the data will be forwarded to the BC Marine and Pile Driving Contractors Association and Svein Vagle at the Institute of Ocean Sciences in Sidney, BC. It is hoped that a database can be built that will catalogue work procedures and reflect the safest and most economical approach to protecting the fish and their habitat.

2)-Timber Piling (creosote):

When driving timber piling, the following Best Management Practices will be employed to minimize/prevent impact to marine fish and their habitat:

- Where possible, new timber piles will comply with the best Management Practices for the use of treated wood in aquatic environments as developed by the Canadian Institute of Treated Wood and the Western Wood Preservers Institute and the DFO document “Guidelines to Protect Fish and Fish Habitat from Treated Wood Used in Aquatic Environments in the Pacific Region”.
- Where the above is not possible creosote piling will stand (weather) for a minimum of 45 days prior to installation.
- These requirements are for new piling only. Reused piling will not be subject to any additional treatments, however, pilings with excessive creosote should be avoided.
- Timber piling is normally driven using a drop hammer, a diesel/air impact hammer or a small vibratory hammer. Because of the relative small diameter of the timber pile, and its excellent energy absorbing quality, there is little threat of sound pressure impacts to fish and their habitat when driving timber piles.
- Environmental monitoring of sound pressure impacts is not required.
- When demolition is required on timber pile structures, the contractor will remove the piling by mechanical means and avoid breaking the piling at the mud line or below. All demolition operations should be monitored in order to control and contain the construction debris and to determine whether there are any effects on fish.

3)-Concrete Piles

When driving concrete piles, regardless of which hammer is being used, the following Best Management Practices will be employed to minimize/prevent impacts to fish habitat:

Less than 24 inch diameter

- The physical design of 24 inch concrete pile dictates that: 1/ the energy required must be controlled in order to prevent the pile from breaking and 2/ the concrete construction of the pile will absorb the energy. These two factors are expected to result in low level shock wave emission (less than 30 kPa.) and minimal or no effects to fish and their habitat should result.
- Environmental monitoring of sound pressure levels is generally not required.

Greater than 24 inch diameter

- When driving concrete piles with a diameter greater than 24 inches using an impact or hydraulic hammer, the following Best Management Practice will be employed to minimize the impact on fish habitat:
- Visual and hydrophone monitoring of the impact on fish by the sound waves emitted will be required. If sound pressures over 30 kPa is measured or a fish kill is evident, the contractor will introduce effective means of reducing the level of the shock waves. Appropriate mitigating measures would be the deployment of a bubble curtain over the full length of the wetted pile. This should reduce the shock waves to an acceptable level.
- If, despite the introduction of preventive measures, further visual/hydrophone monitoring reveals unacceptable conditions (fish kill or sound pressure over 30 kPa), then the work will stop immediately and the methods will be reviewed and corrected.

4)-Steel Pipe Piles

Less than 18 inch diameter

When driving steel piles 18 inches in diameter and less, regardless of the type of hammer being used, the following Best Management Practices will be employed to minimize/prevent impacts to fish habitat:

- Because of the small diameter of the pile it is assumed that the energy required to drive the pile to the final point of installation will not result in shock waves in excess of 30 kPa, therefore, protective measures to reduce shock waves are not expected to be required.

- If, however, ground conditions during pile installation cause a fish kill, work will cease and contractors will be responsible for introducing effective means of reducing the level of shock waves or will introduce measures that will prevent fish from entering the potentially harmful shock wave area. Appropriate mitigating measures would include the deployment a bubble curtain over the full length of the wetted pile. This technique should reduce the shock waves to an acceptable level.
- If, despite the introduction of preventive measures, further visual/hydrophone monitoring reveals unacceptable conditions (fish kill or sound pressure over 30 kPa), then the work will stop immediately and the methods will be reviewed and corrected.

Greater than 24 inches in diameter

When driving steel pipe piles with a diameter greater than 24 inches using impact or hydraulic hammers, the following Best Management Practices will be employed to minimize/prevent impacts to fish habitat:

- Hydrophone and visual monitoring of the effects of the shock waves on fish will be required. If a fish kill occurs, the contractor will introduce effective means of reducing the level of the shockwave. Appropriate mitigating measures would be the deployment of a bubble curtain over the full length of the wetted pile.
- If, despite the introduction of preventive measures, further visual/hydrophone monitoring reveals unacceptable conditions (fish kill or sound pressure over 30 kPa), then the work will stop immediately and the methods will be reviewed and corrected.

5)-Steel Sheet Piles and H-piles

When driving steel sheet piles and H-piles with a drop hammer, an impact hammer or a vibratory hammer, the following Best Management Practices will be employed to minimize the impact on fish habitat:

- It is anticipated that the driving of these types of piles will not generate shock waves in excess of 30kPa, therefore, mitigating measures are not expected to be required.
- If, however, ground conditions during pile installation cause a fish kill, work will cease and contractors will be responsible for introducing effective means of reducing the level of shock waves or will introduce measures that will prevent fish from entering the potentially harmful shock wave area. Appropriate mitigating measures would include the deployment a bubble curtain over the full length of the wetted pile. This technique should reduce the shock waves to an acceptable level.
- If, despite the introduction of preventive measures, further visual/hydrophone monitoring reveals unacceptable conditions (fish kill or sound pressure over 30 kPa), then the work will stop immediately and the methods will be reviewed and corrected.

6)-Stone Column Construction

When installing stone column using a vibroflot, the following Best Management practices will be employed to minimize/prevent impacts to fish habitat:

- The vibrating action and air flush associated with the operation of the probe results in a high degree of turbidity. When this level exceeds the criteria as outlined in the British Columbia Approved Water Quality Guidelines, the contractor will introduce containment methods that are designed to isolate the contaminated area and to prevent fish from entering the contaminated area. Silt curtains and netting are two methods that can provide the necessary protection.
- When supplying the aggregate to the probe, the contractor will ensure that spillage is prevented, thereby providing additional protection to fish habitat.
- An independent environmental consultant will be used to monitor turbidity levels.

7)-Underwater Drilling and Blasting

When performing underwater drilling and blasting the following Best Management Practices will be employed to minimize/prevent impacts to fish habitat:

Underwater Drilling

- Generally, drilling underwater is a process that has very little impact on fish or fish habitat. The procedure does not generate shock waves.
- Contractors will ensure that all attachments (hydraulic connections and couplings) are in good operating order and inspected prior to the start of every day. Spill kits and containment booms must be maintained on-site in case of spills.
- Depending on soil conditions and the potential for turbidity, drill cuttings will be deposited adjacent to the operation, contained on the sea bed or pumped to the surface for deposit into containment skiffs or scows for land disposal when it is determined that the drill cuttings are unsuitable for return to the environment.

Underwater Blasting

Contractors required to perform blasting underwater will provide the following protection to minimize/prevent impacts to fish habitat:

- Because of the potential for harmful shock waves resulting from a blast, a protection shield will surround the immediate blast area. This would be in the form of an air-induced bubble curtain, which has the primary purpose of absorbing the shock wave and a secondary purpose of preventing fish from entering the blast area.
- In order to protect against flying rock, mats (rubber) will be placed over the blasting area. The placement of the mats may also provide protection for any fish swimming in the immediate area.

- Monitoring of fish movement and concentrations will be conducted using a sounder to determine if fish herding or scaring techniques (seal bombs) can be utilized to reduce the presence of fish in the blast area.

8)-Cleaning out Pipe Piles:

When cleaning out pipe piles (i.e.: air lifting) the following Best Management Practices will be employed to minimize/prevent impacts to fish habitat:

- Generally, sediment contained in the pipe is will be pumped to the surface and processed through an approved containment system and disposed of at an approved landfill site.
- In exceptional circumstances, if the sediment is non-toxic, fish are not present in the area, and adjacent fish habitats are not a concern (contact DFO) it may be acceptable to:
 1. Pump the sediment through a discharge tube and allowed it to settle in the immediate area with or without a silt curtain to contain the sediment.
 2. Pump the sediment through a discharge tube and additional flex hosing and redirect it back to the base of the pile.

9) Containment of Concrete Residue and Water Run Off

When placing concrete in form work over or in water, the following Best Management Practices will be employed to minimize/prevent the impacts to fish habitat:

Pouring concrete

- Spills: When pouring concrete all spills of fresh concrete must be prevented. Concrete is toxic to fish due its high pH. If concrete is discharged from the transit mixer directly to the formwork or placed by wheelbarrow, proper sealed chutes must be constructed to avoid spillage. If the concrete is being placed with a concrete pump, all hose and pipe connections must be sealed and locked properly to ensure the lines will not leak or uncouple. Crews will ensure that concrete forms are not filled to overflowing.
- Sealing forms: All concrete forms will be constructed in a manner which will prevent fresh concrete or cement-laden water from leaking into the surrounding water.

Curing concrete

- When fresh water is used to cure concrete, the run off must be monitored for acceptable pH levels. If the pH levels are outside the allowable limits then the run off water must be contained and neutralized.

Grinding concrete

- When grinding cured concrete, the dust and fines entering the water must not exceed the allowable limits for suspended solids. When grinding green or incompletely cured concrete and the dust or fines are entering the water, pH

monitoring will be conducted to ensure allowable ranges are maintained. In the event that the levels are outside the acceptable ranges, preventative measures will be introduced. This may include introducing silt curtains to contain the solids and prevent fish from entering a contaminated area or constructing catch basins to recover the run off and neutralizing it prior to disposal.

Patching concrete

- Spills: When patching concrete, all spills must be contained and prevented from entering the water.

Washing hand tools, pumps and transit mixer

- All tools, pumps, pipes, hoses and trucks used for finishing, placing or transporting fresh concrete must be washed off in such a way as to prevent the wash water and excess concrete from entering the marine environment. The wash water will be contained and disposed of upland in an environmentally acceptable manner.

Whenever there is the possibility of contaminants entering water, the contractor will monitor pH levels to ensure acceptable levels.

APPENDIX

Fisheries and Oceans Canada

Contact List

Name	Telephone No.	Fax. No.
------	---------------	----------

NOTICE OF PROJECT

To: Fisheries and Oceans Canada

Attention:

Fax. No.:

From: "Contractor"

Telephone No.:

Fax. No.:

Representative:

Please be advised of the following marine/pile driving project:

Project Name:

Project Location:

Project Manager/Superintendent:

Project Telephone No.:

Project Fax. No.:

Project commencement date:

APPENDIX 6 – SALTMARSH CONSTRUCTION BUDGET



BUILDING BETTER SINCE 1953

www.arctic-const.ca – info@arctic-const.ca

October 25, 2012

Brad Moffat
Business Development
Stewart World Port

RE: Stewart World Port – Salt Marsh Construction Budget

Dear Mr. Moffat,

The following is a budget and plan to construct a salt marsh for Stewart World Port. Our pricing is based on the attached sketches and instructions received from your office.

Attached you will find a scope of work including assumptions. Based on the details provided, the total costs are estimated at **\$72,160.00 plus taxes.**

If you have any questions or require any further clarification please do not hesitate to give us a call.

Sincerely,

Grant Barley
Vice-President of Operations
Arctic Const. Ltd.

Fort St John - Head Office

11421 Alaska Road
Fort St. John, BC
V1J 6N2

Office 250.785.8995

Fax 250.785.9000

Whitehorse

Suite 106, 2131 2nd Avenue
Whitehorse, YT
Y1A 1C3

Office 867.393.2980

Fax 867.393.2985



BUILDING BETTER SINCE 1953

www.arctic-const.ca – info@arctic-const.ca

Clarifications and Assumptions

Our construction estimate is based on the attached drawings and the following clarifications and assumptions:

The following items will be covered by the Owner and have therefore not been included in our estimate:

1. Development permit fees
2. Financing and Owner's administrative costs
3. City permits, fees, and inspections
4. Wrap up liability insurance, course of construction, builders all risk insurance
5. Legal fees of any kind

General Requirements

We have included all of the following materials and services within the scope of this estimate:

1. Site supervision and administration
2. Staff related expenses
3. Mobilize and demobilize
4. Freight and courier
5. Traffic control
6. Out of town expenses
7. Daily and final clean-up
8. Site signage
9. General equipment rentals
10. Small tools and consumables

Estimate Detail

Summary		
Item	Cost	Comments
Fill	\$37,300	Includes containment berm
Capping	\$2,200	Remove, stockpile, replace
Other Materials	\$1,500	Fencing, etc.
Planting	9,600	
Monitoring	15,000	
Sub Total	65,600	
10% Contingency	6,560	
Total	72,160	

Fill Detail

Footprint (m2)	Depth(m)	Volume(m3)	Cost per m3	Cost for Material
1,865	2	3,730	10	37,300

Planting Detail

# hrs / week	# weeks	# People	Cost / hr	Cost for Planting
40	2		2	60
				9,600

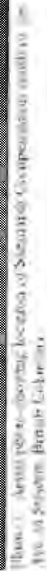
Monitoring Detail

# Visits	Travel	Onsite Costs	Report Costs	Cost for Monitoring
3	1,500		2,000	1,500
				15,000

Construction Plan

All works will be completed in low tide window using the best management practices the client has committed to in their application to the Department of Fisheries and Oceans. Works will be conducted in thirds moving along the fill area.

1. Hoe will be used to strip the top 0.6m of sediments from the existing ocean floor and stockpiled.
2. Fill will be removed via hoe and gravel truck from the Bear River under District of Stewart license of occupation and reclamation permit. Material will be hauled to saltmarsh location via gravel truck and placed with hoe. Final leveling will be completed with dozer.
3. Works will include the construction of a slope stabilization berm. Rock for these works may be obtained under licence from the District of Stewart quarry.
4. Material previously stockpiled will be placed as cap using hoe or dozer.
5. Surface will be sloped to ensure proper drainage and elevation will be confirmed with laser level to ensure surface is within +/- 1 cm of target marsh elevation as confirmed by a qualified biologist.
6. Once all marsh sections are constructed, transplanting will be conducted by labourers under the guidance of a qualified biologist ensuring a minimum density of 1 saltmarsh plug per m².



Learning Structure:
A person-to-person Conference Room
One-on-One

- ▶ **Fluency** conductors have strong physical skills to lead singers and musicians in an ensemble.
- ▶ **Artistic** leaders and conductors have almost total authority in a setting of a standard ensemble or in a unique place of expression.
- ▶ **Arranging** directors or conductors have the responsibility to lead musical ensembles, conduct their ensembles, and to select the repertoire.
- ▶ **The** educational role of voice directors must be to make the best of the music as placed in a particular society & situation, while not ignoring the original meaning of the music.
- ▶ **Typical** job is Voice Director for Deaf



Page 20

DATE	10/10/10
TIME	10:00
LOCATION	10:00
NAME	10:00
ADDRESS	10:00
CITY	10:00
STATE	10:00
ZIP	10:00
PHONE	10:00
FAX	10:00
E-MAIL	10:00
WEBSITE	10:00
OTHER	10:00

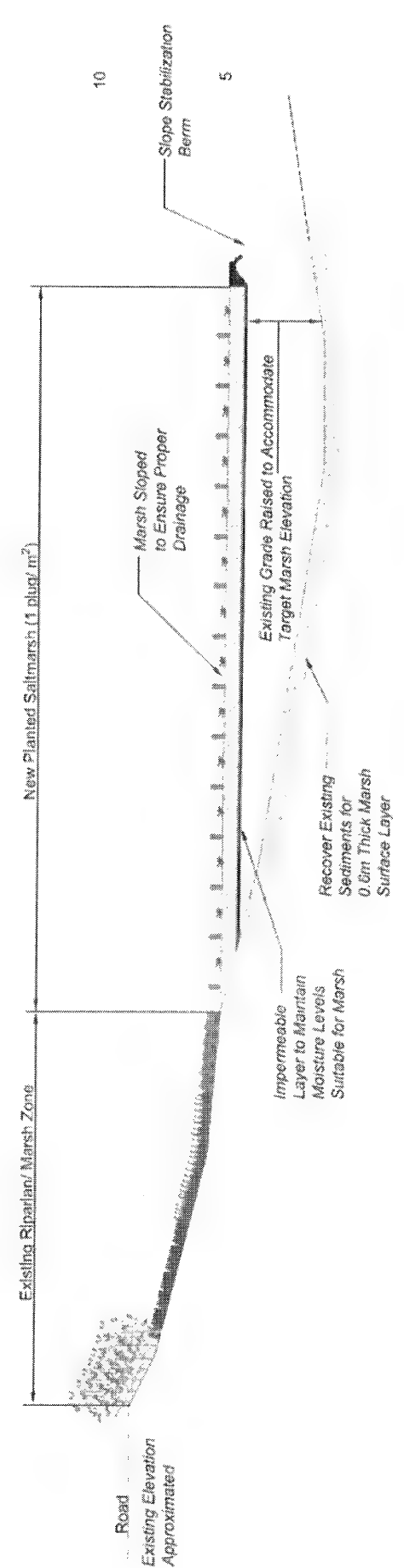
**BALANCED
ENVIRONMENTAL**

**SALT MARSH ENHANCEMENT PLAN/VIEW
HABITAT COMPENSATION
BARGE RAMP RELOCATION PROJECT
STEWART, BRITISH COLUMBIA**

5397-D-58.2

CROSS SECTION A - A'

10 15 20 25 30 35 40 45 50 55



LEGEND

- Existing Structures
- Impermeable Layer
- Slope Stabilization Berm
- Existing Sediments Recovered and Placed on Surface of Marsh Bench
- Saltmarsh Species

DRAWING NOTES

- Existing conditions have been estimated based on aerial imagery and preliminary on-site observations.
- Drawing elevations are in metres and have been approximated.
- Actual location and orientation of saltmarsh must be confirmed by a qualified environmental consultant prior to construction.
- Actual elevation of saltmarsh bench must be confirmed by a qualified environmental consultant to an accuracy of ± 0.05 m prior to construction.
- The constructed area of new saltmarsh must be at least 1.00 m^2 in size and must be planted at a minimum density of 1 saltmarsh plug per square meter.
- See Balanced Drawing 5092, Date 2 for other view details.

MARSH NOTES

- New marsh elevations to be designed to match existing area marsh elevation.
- All marsh plugs impacted by construction to be recovered and re-planted.

Ref. No.	REFRFRNCF
Client	ARCTIC CONSTRUCTION 11421 Alaska Road Fort St. John, BC V1J 6N2
Author	
Checked by	JLE
Drawn by	UC
Date	Oct. 28, 2019
Scale	1:500
Revision	
Sheet	11 of 17

PROJECT	SALT MARSH ENHANCEMENT CROSS SECTION HABITAT COMPENSATION BARGE RAMP RELOCATION PROJECT STEWART, BRITISH COLUMBIA
DWG. No.	5397-D-09.1

BALANCED ENVIRONMENTAL



Fisheries and Oceans Canada
Pêches et Océans Canada

Authorization No: 12-HPAC-PA4-00248

**FISHERIES ACT SUBSECTION 35(2)(b) AUTHORIZATION FOR WORKS, UNDERTAKINGS OR
ACTIVITIES AFFECTING FISH HABITAT**

Authorization issued to:

Name: Stewart World Port Services Ltd.
Attention: Ted Pickell, CEO
Address: 11421 Alaska Road
Fort Saint John, British Columbia
V1J 6N2
Telephone: (250) 262 - 6707
E-mail: tp@stewartworldport.com

Herein referred to as the "Proponent"

Location of Project

The work, undertaking or activity is located within the North end of Portland Canal, adjacent to the Bear River estuary at Stewart, British Columbia.

Latitude and longitude: 55°55'04.31"N - 129°59'38.28"W.

Valid Authorization Period

The valid authorization period for the harmful alteration or disruption, or the destruction, of fish habitat associated with the construction of the Stewart Barge Ramp Relocation project is:

From: March 2, 2013

To: December 31, 2014

The valid Authorization periods for other conditions of this Authorization are as set out below as Conditions of Authorization.

Description of Works, Undertakings or Activities

The project consists of the construction and/ or installation of: a 259m long by approximately 50m wide causeway; a 14.2m long by 21.6m wide concrete and steel pile approach trestle; a 45m long by 8m wide steel barge ramp and three steel berthing dolphins. The harmful alteration or disruption, or the destruction, of fish habitat hereby Authorized is the works, undertakings or activities affecting 12,517m² of fish habitat for the construction of the causeway.



Fisheries and Oceans Canada
Pêches et Océans Canada

Authorization No: 12-HPAC-PA4-00248

FISHERIES ACT SUBSECTION 35(2)(b) AUTHORIZATION FOR WORKS, UNDERTAKINGS OR ACTIVITIES AFFECTING FISH HABITAT

The harmful alteration, disruption and destruction of fish habitat hereby authorized pursuant to s.35(2)(b) is as follows:

- 10,282m² of intertidal feeding habitat, mud and pebble substrate, as a result of infilling for causeway construction,
- 1,570m² of intertidal refuge habitat, riprap substrate, as a result of infilling for causeway construction,
- 655m² of subtidal crab habitat, pebble substrate, as a result of infilling for causeway construction.

As described on page 4-9 of the *Aquatic Effects Assessment – Barge Ramp Relocation Project Stewart, British Columbia* produced by Balanced Environmental Services Inc. File 5397-R-05.2, dated October 25, 2012 (Schedule 1).

Conditions of Authorization

1. The conditions of this Authorization notwithstanding, should the above works, undertakings or activities, due to weather conditions, different soil or other natural conditions, or for any other reason, appear, in the opinion of Fisheries and Oceans Canada ("DFO") likely to cause greater impacts than the parties previously contemplated, then DFO may direct the Proponent, and its agents, and contractors, to suspend or alter works and activities associated with the project, to avoid or mitigate adverse impacts to fisheries resources. DFO may also direct the Proponent and its agents, and contractors, to carry out at the Proponents' expense any works or activities deemed necessary by DFO to avoid or mitigate further adverse impacts to fisheries resources. In circumstances where DFO is of the view that greater impacts may occur than were contemplated by the parties, DFO may also modify or rescind this Authorization. If the authorization is to be changed the Proponent will be given an opportunity to discuss any proposed modifications or rescission.
2. Conditions that relate to the Proponent's plan:
 - 2.1. The Proponent confirms that all plans and specifications relating to this Authorization have been duly prepared and reviewed by appropriate professionals working on behalf of the Proponent. The Proponent acknowledges that they are solely responsible for all design, safety and workmanship aspects of all of the works associated with this Authorization.
 - 2.2. The construction must comply with those criteria as identified within this Authorization. Harmful alteration or disruption, or the destruction, of fish habitat other than that specifically identified within this Authorization is not permitted.



Fisheries and Oceans Canada
Pêches et Océans Canada

Authorization No: 12-HPAC-PA4-00248

FISHERIES ACT SUBSECTION 35(2)(b) AUTHORIZATION FOR WORKS, UNDERTAKINGS OR ACTIVITIES AFFECTING FISH HABITAT

- 2.3. If, as a result of engineering optimization studies or any other changes in the project design, there is an increase in the loss to fish habitat that is in addition to, or in locations other than what is proposed in drawings presented in the *Aquatic Effects Assessment – Barge Ramp Relocation Project Stewart, British Columbia* File 5397-R-05.2 Balanced Environmental Services Inc. dated October 25, 2012 (Schedule 1), these changes will be presented to DFO for review and determination. If an increase or decrease in the total amount of compensatory works is required as a result of these changes.
- 2.4. If the Proponent wishes to transfer its interest in the Project, and in consultation with DFO, the Transferee assumes the ongoing intent and obligations of this Authorization in a form satisfactory to DFO; the Proponent shall thereafter be relieved of these obligations.
-
- 2.5. Works will be conducted following the practices outlined in the following documents:
- *Aquatic Effects Assessment – Barge Ramp Relocation Project Stewart, British Columbia* File 5397-R-05.2 Balanced Environmental Services Inc. dated October 25, 2012 (Schedule 1);
 - *Appendix A – Saltmarsh Enhancement Construction Plan* Balanced Environmental Services Inc. dated January 4, 2013 (Schedule 2);
 - *Appendix B – Saltmarsh Location* Balanced Environmental Services Inc. dated January 4, 2013 (Schedule 3);
 - *Appendix C – Construction Mitigation Measures* Balanced Environmental Services Inc. dated January 4, 2013 (Schedule 4);
 - *Appendix D – Compensation Plan* Balanced Environmental Services Inc. dated January 4, 2013 (Schedule 5);
 - *Appendix E – Monitoring Plan* Balanced Environmental Services Inc. dated January 4, 2013 (Schedule 6).
3. Conditions that relate to the mitigation of potential harmful alteration or disruption, or the destruction, of fish habitat. The following measures shall be implemented:
- 3.1. Mitigation and best management practices outlined in *Appendix C – Construction Mitigation Measures* Balanced Environmental Services Inc. dated January 4, 2013 (Schedule 4).
- 3.2. Wherever practicable, works will be conducted at low tide and in the dry. Where in-water works are required outside of the least risk timing window of November 30 - February 15, every effort shall be made to isolate the in-water works from tidal waters such that fish are prevented from accessing the work area, and sediments, sediment-laden water and turbid water are contained and prevented from leaving the work area. This shall be



Fisheries and Oceans Canada / Pêches et Océans Canada

Authorization No: 12-HPAC-PA4-00248

FISHERIES ACT SUBSECTION 35(2)(b) AUTHORIZATION FOR WORKS, UNDERTAKINGS OR ACTIVITIES AFFECTING FISH HABITAT

accomplished by measures including but not limited to full depth 'silt curtains' or other barrier materials that isolate and contain the work area.

- 3.3. All rock or materials used to construct the barge ramp must be imported to the site. Only clean, imported angular rock free of fine sediments, organic material or other deleterious substances may be used in the construction of these features. Native beach sediments or rock may not be relocated or used for any construction purpose. The only exception to this condition relates to the re-use of rock from outer face of the existing riprap barge ramp structure. To the extent practicable, rocks with attached algae and invertebrates from the intertidal surface of the existing rip rap causeway in the location subject to infill are to be salvaged and utilized on the outer surface of the proposed causeway at tidal elevations appropriate for those organisms.
- 3.4. To the extent practicable, marine invertebrates shall be salvaged from areas within the footprint of the proposed causeway prior to infill works.
- 3.5. There shall be no dredging, excavation or other disturbance of the seabed, intertidal foreshore, or upland adjacent to the shore, except for those works and activities specified in the project documents attached to this authorization. Fish habitat outside of the defined work areas shall be protected through the application of appropriate mitigation measures.
- 3.6. All machinery must be clean and in proper working condition and no fuels, lubricants, or construction wastes are to enter any marine fish habitat.
- 3.7. The Proponent shall ensure that barges or other vessels used during construction are not permitted to ground on the foreshore or seabed or disturb the foreshore or seabed as a result of vessel propeller wash. Use of vertical spuds or anchors to hold barges or other vessels in place is acceptable.
- 3.8. Sedimentation or turbidity of the foreshore and near shore marine areas generated by project works, undertakings or activities shall be minimized. In both regards, reference should be made to the applicable water quality criteria as described in the British Columbia Water Quality Guidelines (Criteria): 2010 Edition produced by BC Ministry of Environment.
- 3.9. A vibratory hammer or non-powered drop hammer should be used to install steel pile pipes greater than 16 inches diameter. If steel pipes greater than 16 inches diameter will be installed using a diesel hammer, air hammer, or similar powered hammer equipment instead of using a vibratory or non powered drop hammer, mitigation measures will be incorporated (e.g. deployment of bubble curtain) to ensure that fish are not harmed by underwater sound levels (peak pressures) greater than 30 kPa as measured at a distance of greater than one metre from any piling being driven. Reference should be made to the applicable Best Management Practices for Pile Driving (BC Marine and Pile Driving Contractors Association).



Fisheries and Oceans Canada
Pêches et Océans Canada

Authorization No: 12-HPAC-PA4-00248

FISHERIES ACT SUBSECTION 35(2)(b) AUTHORIZATION FOR WORKS, UNDERTAKINGS OR ACTIVITIES AFFECTING FISH HABITAT

3.10. Matters pertaining to the discharge of deleterious substances to fish bearing waters are under the jurisdiction of Environment Canada. The proponent is responsible for contacting Environment Canada for further information and advice.

4. Conditions that relate to the compensation for the loss of up to 12,517m² of fish habitat.

4.1. A minimum of 1,865m² of salt marsh bench shall be created as compensatory fish habitat within the Stewart estuary as follows:

4.1.1. The compensatory salt marsh bench fish habitat shall be completed as described in the following plans:

- *Appendix A – Saltmarsh Enhancement Construction Plan* Balanced Environmental Services Inc. dated January 4, 2013 (Schedule 2);
- *Appendix B – Saltmarsh Location* Balanced Environmental Services Inc. dated January 4, 2013 (Schedule 3);
- *Appendix D – Compensation Plan* Balanced Environmental Services Inc. dated January 4, 2013 (Schedule 5)

4.1.2. The construction of the compensatory fish habitat shall be completed before December 1, 2013.

4.1.3. Salt marsh plugs shall be obtained from local donor sites. Salt marsh plug collection shall not negatively affect the salt marsh function and/ or structure at, or adjacent to, the donor locations.

4.2. 6,921m² of refuge habitat shall be created by placing riprap on the outer surface of the causeway, below the annual mean high tide level.

4.3. The compensatory habitats will be deemed to be functioning as intended if, in the opinion of DFO, the compensatory fish habitat meets the underlying conditions:

4.3.1. The compensatory habitat has been constructed in accordance with the terms and conditions of this authorization; and

4.3.2. The compensatory habitat is providing physically stable, productive fish habitat that is functioning superior to the pre-existing condition with regard to its benefit to salmonids; and

4.3.3. The compensatory salt marsh bench habitat is illustrating growth, density and complexity of macro vegetation and invertebrates similar to reference sites (*More information on the reference sites can be found in section 5 of this document*).



Fisheries and Oceans Canada
Pêches et Océans Canada

Authorization No: 12-HPAC-PA4-00248

FISHERIES ACT SUBSECTION 36(2)(b) AUTHORIZATION FOR WORKS, UNDERTAKINGS OR ACTIVITIES AFFECTING FISH HABITAT

4.3.4. The riprap rock compensation habitat is of suitable size, structure and stability to provide interstitial refuge habitat for fish, and attachment substrate for colonizing marine vegetation.

4.3.5. Fish are observed and documented in and around the riprap structure.

4.4. If, following the initial monitoring period, and any extensions thereof, the compensatory habitat is not functioning as intended, the Proponent agrees to complete remedial work at the direction of DFO until the compensatory habitat is functioning as described above. If it appears that further remedial work is not likely to rectify the situation, the Proponent shall then propose alternative compensatory works to achieve the overall objective of the fish habitat compensation plan.

4.5. If at any time the Proponent becomes aware that the compensatory habitat is not functioning as intended the Proponent shall carry out any works which are necessary to enable the compensatory habitat to function as designed.

5. Conditions that relate to monitoring of the construction, mitigation and compensation, the "Monitoring Program", are as follows:

5.1. Proponent will adhere to conditions outlined in the following document: *Appendix E – Monitoring Plan* Balanced Environmental Services Inc. dated January 4, 2013 (Schedule 6

5.2. The Proponent will retain a qualified Environmental Monitor (the "Monitor") for the Project, who is appropriately trained to undertake and/or oversee the work detailed herein.

5.3. The Monitor will be on-site full time during any works that pose a risk to fish or fish habitat such as in-water and intertidal works.

5.4. The Monitor must have written authority to modify or suspend construction operations that violate safe environmental practices and procedures.

5.5. The Monitor shall be responsible for:

5.5.1. Undertaking or overseeing the contractor responsible for planning and installation of fish exclusion devices;

5.5.2. Undertaking or overseeing the contractor responsible for planning and implementation of sediment control measures;

5.5.3. Day-to-day monitoring of construction activities to ensure that all works are in compliance with the conditions outlined within the Authorization and in accordance with known best management practices.



Fisheries and Oceans Canada
Pêches et Océans Canada

Authorization No: 12-HPAC-PA4-00248

FISHERIES ACT SUBSECTION 35(2)(b) AUTHORIZATION FOR WORKS, UNDERTAKINGS OR ACTIVITIES AFFECTING FISH HABITAT

5.5.4. Completion of a weekly environmental monitoring report summarizing completed works, difficulties encountered and actions taken to correct problems, and project elements to be constructed in the following week. These reports shall be provided to DFO upon request.

5.6. Condition that relate to eulachon and herring monitoring and mitigation:

5.6.1. In-water work that occurs between February 15 and May 1 in any year shall incorporate a eulachon and herring monitoring program prepared by a qualified environmental professional (QEP) with extensive marine monitoring experience. A qualified environment monitor shall be present to monitor eulachon presence and to implement appropriate mitigation measures to avoid harm to these species. The plan shall include:

5.6.1.1. Where there is direct or indirect indication of the presence of eulachon and/ or herring (including, but not limited to increased bird or marine mammal activity, visual sightings) within 500m of the project, works shall cease immediately and the incident reported to the QEP. The QEP will assess the potential for the works to negatively impact eulachon and/ or herring and implement necessary mitigation measures to ensure their protection. Works shall not resume without written recommendation from the QEP.

5.6.1.2. Where it is determined that the mitigation measures will not adequately protect eulachon and/ or herring and there is the potential for these species to be harmed or their natural life cycle to be disrupted, the proponent must cease operations and the QEP shall inform DFO Habitat Management Team Leader, North Coast Area office immediately.

5.7. A Post-construction Monitoring Report will be provided to DFO within 90 days of completion of construction. The Post-construction Monitoring Report shall contain:

5.7.1. Detailed summary of compliance with the conditions of this Authorization;

5.7.2. Provision of surveyed as-built drawings of the final HADD footprint(s) and location(s);

5.7.3. Detailed summary of compliance with the compensation plan (e.g. size and quality of construction materials, construction methodology, etc.) including provision of surveyed as-built drawings of the final Compensation works detailing specific footprint(s) and location(s);

5.7.4. Dated colour photographs of: 1) the site (pre-construction), 2) the works (in progress), and 3) the completed project;

5.7.5. Description of any contingency measures that were followed in the event that mitigation measures did not function as described in the Proponent plan.



Fisheries and Oceans Canada
Pêches et Océans Canada

Authorization No: 12-HPAC-PA4-00248

FISHERIES ACT SUBSECTION 35(2)(b) AUTHORIZATION FOR WORKS, UNDERTAKINGS OR ACTIVITIES AFFECTING FISH HABITAT

5.7.6. Monitoring of the compensation will occur in years 1, 3 and 5 beginning the year following completion of construction (eg. construction completed in 2014; monitoring 2015, 2017 and 2019). A Compensation Monitoring Report will be provided to DFO by September 20th of each year that includes:

5.7.6.1. Results from monitoring procedures outlined in Section 7.6 of *Appendix E – Monitoring Plan* Balanced Environmental Services Inc. dated January 4, 2013 (Schedule 6)

5.7.6.2. Description of results, including date and supporting photographs, of fish trapping and observations demonstrating fish use of the habitat structures to support determination of functioning as intended;

5.7.6.3. A written description of the structural stability and condition of the compensatory habitat; and

5.7.6.4. Dated colour photographs of the compensatory habitat taken from established photo points.

5.8. All monitoring reports, notifications or results will be submitted to DFO Fisheries Protection Program North Coast Area Office by the dates specified within this Authorization.

6. Conditions that relate to the financial security.

6.1. The proponent has delivered two letters of credit from a Canadian Bank in the total sum of [REDACTED] that renew annually, and is in a form acceptable to DFO.

6.2. DFO may withdraw funds from the letters of Credit to retain an independent contractor to undertake any activity described in the conditions should these not be completed by the Proponent.

6.3. The Letter of Credit will be returned to the Proponent when DFO determines that compensation is functioning as intended. This will be determined after the final report of the 5 year monitoring plan is reviewed and approved by DFO on or before December 30, 2019.

7. Conditions that relate to notification.

7.1. Written notification of the commencement of works or undertakings shall be provided to DFO Fishery Protection Program, Prince Rupert Office at least 10 days prior to the initiation of those works or undertakings.



Fisheries and Oceans Canada
Pêches et Océans Canada

Authorization No: 12-HPAC-PA4-00248

**FISHERIES ACT SUBSECTION 35(2)(b) AUTHORIZATION FOR WORKS, UNDERTAKINGS OR
ACTIVITIES AFFECTING FISH HABITAT**

The holder of this Authorization is hereby authorized under the authority of subsection 35(2)(b) of the *Fisheries Act* to carry out the work or undertaking described herein.

This authorization is valid only with respect to fish habitat and for no other purposes. It does not purport to release the Proponent from any obligation to obtain permission from or to comply with the requirements of any other regulatory agencies.

This Authorization does not permit the deposit of a deleterious substance in water frequented by fish. Subsection 36(3) of the *Fisheries Act* prohibits the deposit of any deleterious substances into waters frequented by fish except under conditions authorized by regulations made by Governor in Council.

Failure to comply with any condition of this Authorization may result in charges under the *Fisheries Act*.

This authorization form should be held on site and work crews should be made familiar with the conditions attached.



Fisheries and Oceans
Canada

Pêches et Océans
Canada

Authorization No: 12-HPAC-PA4-00248

**FISHERIES ACT SUBSECTION 35(2)(b) AUTHORIZATION FOR WORKS, UNDERTAKINGS OR
ACTIVITIES AFFECTING FISH HABITAT**

Date of issuance: 17th day of March, 2013

Approved by:

for Joy Millie
Jeffrey Lemieux

Title: Area Manager, North Coast Area
Ecosystem Management Branch
Fisheries and Oceans Canada

Stewart World Port Services Ltd. acknowledges that DFO has consulted with it regarding the terms of this Authorization, and confirms that it has reviewed and understands the terms of this Authorization, and it will comply with them.

Executed by an authorized signatory of
Stewart World Port Services Ltd., 17th
day of MARCH, 2013 in the presence of:

Stewart World Port Services Ltd.

[Redacted Signature]
Witness (signature)

Per:

[Redacted Signature]
Authorized signatory

[Redacted Name]
Name

TED PICKELL
Name

CHAIRMAN, CEO
Title



Fisheries and Oceans
Canada

Pêches et Océans
Canada

Authorization No: 12-HPAC-PA4-00248

**FISHERIES ACT SUBSECTION 35(2)(b) AUTHORIZATION FOR WORKS, UNDERTAKINGS OR
ACTIVITIES AFFECTING FISH HABITAT**

SCHEDULE 1

*Aquatic Effects Assessment – Barge Ramp Relocation Project Stewart, British Columbia produced
by Balanced Environmental Services Inc. File 5397-R-05.2, Dated October 25, 2012.*

SCHEDULE 2

*Appendix A – Saltmarsh Enhancement Construction Plan Balanced Environmental Services Inc.
dated January 4, 2013.*

SCHEDULE 3

Appendix B – Saltmarsh Location Balanced Environmental Services Inc. dated January 4, 2013

SCHEDULE 4

*Appendix C – Construction Mitigation Measures Balanced Environmental Services Inc. dated
January 4, 2013.*

SCHEDULE 5

Appendix D – Compensation Plan Balanced Environmental Services Inc. dated January 4, 2013.

SCHEDULE 6

Appendix E – Monitoring Plan Balanced Environmental Services Inc. dated January 4, 2013.

Pages 113 to / à 135
are not relevant
sont non pertinentes

BALANCED ENVIRONMENTAL

December 20, 2012

Balanced File No.: 5397-R-10.1

Arctic Construction
11421 Alaska Road
Fort St. John, B.C.
V1J 6N2

Attn: Brad Moffat

VIA EMAIL: bmoffat@stewartworldport.com
Bradley.Koroluk@dfo-mpo.gc.ca

**Re: Eulachon Monitoring Plan
Barge Ramp Relocation Project
Stewart, British Columbia**

Brad,

Pacific Eulachon (*Thaleichthys pacificus*) have the potential to utilize the Bear River adjacent the proposed Barge Ramp construction site. The project footprint is not located within Eulachon critical habitat. As an added measure, the following Eulachon Monitoring Plan will be implemented on the project:

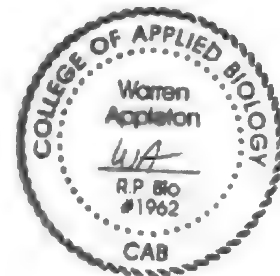
- A safety zone of 500 metres will be established for any in-water works. — ? ?
- No in-water works performed within 30 minutes of eulachon sighting in safety zone.
- Work crews will be trained to improve eulachon awareness prior to in-water works
- Any sightings to be reported immediately to Warren Appleton, RPBio:
 - 1-604-996-7113, or,
 - warren@balanced.ca
- An environmental monitor will be onsite as required → ? when is that.

Based on the above, the construction activities are not expected to impact eulachon fisheries resources.

Regards,

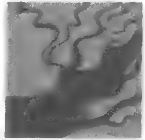
Sincerely,
BALANCED ENVIRONMENTAL SERVICES INC.


Warren Appleton, RPBio
Senior Project Biologist



WA/xie

Cc/ Bradley Koroluk – Habitat Biologist, Fisheries and Oceans Canada



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 1 of 7

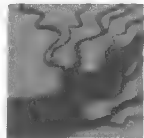
Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
 PATH No.: 16-HPAC-00732 Habitat File No.: Receive Date: 2016/07/07

Section A - PATH Main Information Screen

Category:			
Prop. Start:	2016/07/11	Prop. Completion:	2016/07/31
Assessor:	Mercer, Vance Fisheries Protection Program Biologist 200 - 401 Burrard Street Vancouver BC V6C 3S4 (604) 666-0280	Proponent:	Pettit, Brad Stewart World Port Services Ltd. 11421 Alaska Rd Fort St. John BC V1J 6N2
		Other Contact:	
Local Water:	Portland Canal at the mouth of the Bear River	Nearest Community:	Stewart
County / Municipality:	District of Stewart	Province / Territory:	British Columbia
Geo. Obj. Type:	Point	Latitude/Longitude:	55°55'04" 129°59'35"
Location Detail:	From Terrace, BC drive east to Kitwanga, drive north on highway 37 to Meziadin Junction, turn west on Highway 37a, drive to Stewart town site, and drive to the end of Railway St. to reach D17318 (Cassiar District).	Legal Description:	
UTM Zone:	9	Decimal Latitude:	55.92
UTM Easting:	437927	Decimal Longitude:	-129.99
UTM Northing:	6197365		
<u>Act/Reg.</u>	<u>Para./Sec.</u>	<u>Act or Regulation</u>	<u>Paragraphs or Sections</u>

Section B - PATH Action Log Record

Action ID No.:	28	Action Date:	2016/08/02
Action:	Authorized - Fisheries Act Authorization Issued		
From:	Ω Gebrehiwot, Awet {x}	Effective Date:	2016/08/02
To:	Rotinsky, Brenda	Expiry Date:	2016/08/15
		Compensation:	<input checked="" type="checkbox"/>
Auth. Rationale:	CEAA EA is not required - NOT on Federal Lands		



PATH

Compliance Monitoring Form

Authorization

Report Date:

Page 2 of 7
2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

Section C - Complete at site visit and enter on Site Visit screen in PATH

Date of Site Visit:

Visited by:

Who else was on site? (ie. Proponent representative, etc.)

Were photos taken or provided? (Note: Digital photos can be saved on the PATH Picture screen)

☐ Yes

☐ No

Was other data collected?

☐ Yes

☐ No

Is a Follow up Site Visit Required?

☐ Yes - Date for planned Follow up visit:

☐ No

General Observations - Enter a brief description (ie. weather, time of day, etc.)



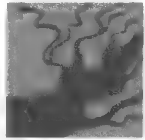
Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management

000138



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

Section C (Continued) - Enter on Compliance Monitoring screen in PATH

Work Status:

☐ Not Started ☒ In Progress ☐ Completed: ☐ Unknown

Section C - Authorization Issued

1. Were the proposed works/undertakings/activities completed as described in the authorization?

☐ Yes ☐ No ☐ Partial ☒ Unknown

works in progress

2. Was the serious harm to fish as described in the authorization?

☐ Yes ☐ No ☐ Partial ☒ Unknown

works in progress

3. If Species at Risk Act(SARA) conditions are included in the authorization, were the impacts on aquatic SARA species as described?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

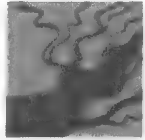
4. Were the measures and standards to avoid and mitigate implemented as described in the authorization?

☐ Yes ☐ No ☐ Partial ☒ Unknown

monitoring report provided by proponent lacking sufficient detail to make determination

5. Were the measures and standards to avoid and mitigate effective in preventing serious harm to fish or impacts to aquatic SARA species?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.: Receive Date: 2016/07/07

6. If included in the authorization, were the contingency measures implemented?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

—

7. Were the contingency measures effective in preventing serious harm to fish or impacts to aquatic SARA species?

☐ Yes ☐ No ☐ Unknown ☒ Not Applicable

—

8. Were the offsetting measures implemented as described?

☐ Yes ☒ No ☐ Partial ☐ Unknown ☐ Not Applicable

"Emergency Authorization" - offsetting to occur post works.

9. Were the offsetting measures effective?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

—

10. How was the effectiveness of the measures assessed?

☐ Observational ☐ Functional ☐ Direct ☐ Other ☒ Not Applicable

—

Section C (Continued)

1. Is there a compliance issue with the Fisheries Act?

☐ Yes ☐ No ☒ Unknown



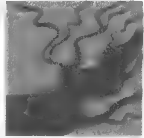
Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management

000140



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

—

2. Is there a compliance issue with the Species at Risk Act?

☐ Yes ☒ No ☐ Unknown

—

3. Did the proponent notify DFO?

☒ Yes ☐ No ☐ Unknown ☐ Not Applicable

—

4. Select the section(s) of the Fisheries Act and/or the Species at Risk Act where non-compliance applies.

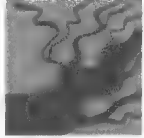
☐ FA21 ☐ FA20 ☐ FA35 ☐ FA38 ☐ Not Applicable
☐ SARA32 ☐ SARA33 ☐ SARA58

—

5. If there is a compliance issue with the Fisheries Act or the Species at Risk Act, will there be further compliance action recommended?

☐ Yes ☐ No ☒ Unknown ☐ Not Applicable

—



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 6 of 7

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

6. Is a follow up site visit required?

☐ Yes

☒ No

—

7. Is compliance monitoring now complete on this action?

☐ Yes

☒ No

—

Section D

Description:

Action Log:

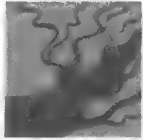


Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management



PATH

Compliance Monitoring Form

Authorization

Report Date: Page 7 of 7
2019/08/30

Title:	Stewart World Port Groyne Installation, Bear River, Stewart, BC		
PATH No.:	16-HPAC-00732	Habitat File No.:	Receive Date: 2016/07/07

Request for FA Authorization, Section 6 Factors, Approval Letter, Signed Authorization, Notes from Rebecca Reid

-----Original Message-----

From: Gebrehiwot, Awet
Sent: August-02-16 4:15 PM
To: Rotinsky, Brenda
Cc: Nutton, Byron; Seefried, Len
Subject: RE: 16-HPAC-00732 Stewart World Port Emergency Authorization

Hi Len and Byron,

Attached please find the signed Authorization.

I have also attached a couple of comments from RDG. Thank you, Awet

-----Original Message-----

From: Rotinsky, Brenda
Sent: July-29-16 4:19 PM
To: Gebrehiwot, Awet
Cc: Nutton, Byron; Seefried, Len
Subject: 16-HPAC-00732 Stewart World Port Emergency Authorization

Hi Awet,

As discussed, you have the complete package for processing the Emergency Authorization for the above noted project on Tuesday morning. It has finished the BIO5 sign-off so is good to go right to the RDs office. When the Authorization is signed off, please send it to Byron and Len and cc me.

Thank you!

Brenda



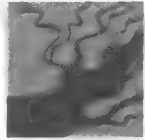
Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management

000143



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 1 of 7

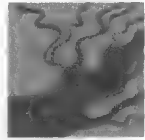
Title:	Stewart World Port Groyne Installation, Bear River, Stewart, BC		
PATH No.:	16-HPAC-00732	Habitat File No.:	Receive Date: 2016/07/07

Section A - PATH Main Information Screen

Category:			
Prop. Start:	2016/07/11	Prop. Completion:	2016/07/31
Assessor:	Mercer, Vance Fisheries Protection Program Biologist 200 - 401 Burrard Street Vancouver BC V6C 3S4 (604) 666-0280	Proponent:	Pettit, Brad Stewart World Port Services Ltd. 11421 Alaska Rd Fort St. John BC V1J 6N2
		Other Contact:	
Local Water:	Portland Canal at the mouth of the Bear River	Nearest Community:	Stewart
County / Municip.:	District of Stewart	Province / Territory:	British Columbia
Geo. Obj. Type:	Point	Latitude/Longitude:	55°55'04" 129°59'35"
Location Detail:	From Terrace, BC drive east to Kitwanga, drive north on highway 37 to Meziadin Junction, turn west on Highway 37a, drive to Stewart town site, and drive to the end of Railway St. to reach D17318 (Cassiar District).	Legal Description:	
UTM Zone:	9	Decimal Latitude:	55.92
UTM Easting:	437927	Decimal Longitude:	-129.99
UTM Northing:	6197365		
<u>Act/Reg.</u>	<u>Para./Sec.</u>	<u>Act or Regulation</u>	<u>Paragraphs or Sections</u>

Section B - PATH Action Log Record

Action ID No.:	28	Action Date:	2016/08/02
Action:	Authorized - Fisheries Act Authorization Issued		
From:	Q Gebrehiwot, Awet {x}	Effective Date:	2016/08/02
To:	Rotinsky, Brenda	Expiry Date:	2016/08/15
		Compensation:	<input checked="" type="checkbox"/>
Auth. Rationale:	CEAA EA is not required - NOT on Federal Lands		



PATH

Compliance Monitoring Form

Authorization

Report Date: Page 2 of 7
2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

Section C - Complete at site visit and enter on Site Visit screen in PATH

Date of Site Visit:

Visited by:

Who else was on site? (ie. Proponent representative, etc.)

Were photos taken or provided? (Note: Digital photos can be saved on the PATH Picture screen)

☐ Yes

☐ No

Was other data collected?

☐ Yes

☐ No

Is a Follow up Site Visit Required?

☐ Yes - Date for planned Follow up visit:

☐ No

General Observations - Enter a brief description (ie. weather, time of day, etc.)



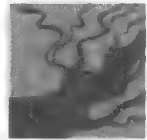
Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management

000145



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

Section C (Continued) - Enter on Compliance Monitoring screen in PATH

Work Status:

☐ Not Started ☒ In Progress ☐ Completed: ☐ Unknown

Section C - Authorization Issued

1. Were the proposed works/undertakings/activities completed as described in the authorization?

☐ Yes ☒ No ☐ Partial ☐ Unknown

Works are still in progress

2. Was the serious harm to fish as described in the authorization?

☐ Yes ☐ No ☐ Partial ☒ Unknown

Works are still in progress

3. If Species at Risk Act(SARA) conditions are included in the authorization, were the impacts on aquatic SARA species as described?

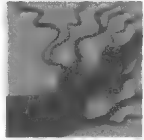
☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

4. Were the measures and standards to avoid and mitigate implemented as described in the authorization?

☒ Yes ☐ No ☐ Partial ☐ Unknown

5. Were the measures and standards to avoid and mitigate effective in preventing serious harm to fish or impacts to aquatic SARA species?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 4 of 7

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

6. If included in the authorization, were the contingency measures implemented?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

—

7. Were the contingency measures effective in preventing serious harm to fish or impacts to aquatic SARA species?

☐ Yes ☐ No ☐ Unknown ☒ Not Applicable

—

8. Were the offsetting measures implemented as described?

☐ Yes ☒ No ☐ Partial ☐ Unknown ☐ Not Applicable

Works are still in progress due to emergency nature of authorization

9. Were the offsetting measures effective?

☐ Yes ☐ No ☐ Partial ☒ Unknown ☐ Not Applicable

Offsetting measures not yet implemented due to emergency nature of authorization

10. How was the effectiveness of the measures assessed?

☐ Observational ☐ Functional ☐ Direct ☐ Other ☒ Not Applicable

—

Section C (Continued)

1. Is there a compliance issue with the Fisheries Act?

☐ Yes ☒ No ☐ Unknown

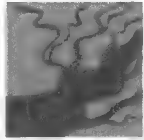


Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details.

Habitat Management



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

—

2. Is there a compliance issue with the Species at Risk Act?

☐ Yes

☒ No

☐ Unknown

—

3. Did the proponent notify DFO?

☒ Yes

☐ No

☐ Unknown

☐ Not Applicable

—

4. Select the section(s) of the Fisheries Act and/or the Species at Risk Act where non-compliance applies.

☐ FA21

☐ FA20

☐ FA35

☐ FA38

☐ Not Applicable

☐ SARA32

☐ SARA33

☐ SARA58

—

5. If there is a compliance issue with the Fisheries Act or the Species at Risk Act, will there be further compliance action recommended?

☐ Yes

☐ No

☐ Unknown

☒ Not Applicable

—



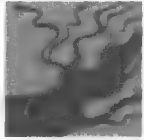
Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management

000148



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 6 of 7

Title:	Stewart World Port Groyne Installation, Bear River, Stewart, BC		
PATH No.:	16-HPAC-00732	Habitat File No.:	Receive Date: 2016/07/07

6. Is a follow up site visit required?

☐ Yes

☒ No

—

7. Is compliance monitoring now complete on this action?

☐ Yes

☒ No

—

Section D

Description:

Action Log:



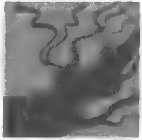
Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management

000149



PATH

Compliance Monitoring Form

Authorization

Report Date: Page 7 of 7
2019 08 30

Title:	Stewart World Port Groyne Installation, Bear River, Stewart, BC		
PATH No.:	16-HPAC-00732	Habitat File No.:	Receive Date: 2016/07/07

Request for FA Authorization, Section 6 Factors, Approval Letter, Signed Authorization, Notes from Rebecca Reid

-----Original Message-----

From: Gebrehiwot, Awet
Sent: August-02-16 4:15 PM
To: Rotinsky, Brenda
Cc: Nutton, Byron; Seefried, Len
Subject: RE: 16-HPAC-00732 Stewart World Port Emergency Authorization

Hi Len and Byron,

Attached please find the signed Authorization.

I have also attached a couple of comments from RDG. Thank you, Awet

-----Original Message-----

From: Rotinsky, Brenda
Sent: July-29-16 4:19 PM
To: Gebrehiwot, Awet
Cc: Nutton, Byron; Seefried, Len
Subject: 16-HPAC-00732 Stewart World Port Emergency Authorization

Hi Awet,

As discussed, you have the complete package for processing the Emergency Authorization for the above noted project on Tuesday morning. It has finished the BIO5 sign-off so is good to go right to the RDs office. When the Authorization is signed off, please send it to Byron and Len and cc me.

Thank you!
Brenda



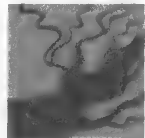
Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management

000150



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 1 of 7

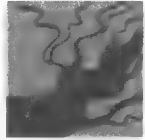
Title:	Stewart World Port Groyne Installation, Bear River, Stewart, BC		
PATH No.:	16-HPAC-00732	Habitat File No.:	Receive Date: 2016/07/07

Section A - PATH Main Information Screen

Category:			
Prop. Start:	2016/07/11	Prop. Completion:	2016/07/31
Assessor:	Mercer, Vance Fisheries Protection Program Biologist 200 - 401 Burrard Street Vancouver BC V6C 3S4 (604) 666-0280	Proponent:	Pettit, Brad Stewart World Port Services Ltd. 11421 Alaska Rd Fort St. John BC V1J 6N2
		Other Contact:	
Local Water:	Portland Canal at the mouth of the Bear River	Nearest Community:	Stewart
County / Municip.:	District of Stewart	Province / Territory:	British Columbia
Geo. Obj. Type:	Point	Latitude/Longitude:	55°55'04" 129°59'35"
Location Detail:	From Terrace, BC drive east to Kitwanga, drive north on highway 37 to Meziadin Junction, turn west on Highway 37a, drive to Stewart town site, and drive to the end of Railway St. to reach D17318 (Cassiar District).	Legal Description:	
UTM Zone:	9	Decimal Latitude:	55.92
UTM Easting:	437927	Decimal Longitude:	-129.99
UTM Northing:	6197365		
<u>Act/Reg.</u>	<u>Para./Sec.</u>	<u>Act or Regulation</u>	<u>Paragraphs or Sections</u>

Section B - PATH Action Log Record

Action ID No.:	28	Action Date:	2016/08/02
Action:	Authorized - Fisheries Act Authorization Issued		
From:	Ω Gebrehiwot, Awet {x}	Effective Date:	2016/08/02
To:	Rotinsky, Brenda	Expiry Date:	2016/08/15
		Compensation:	<input checked="" type="checkbox"/>
Auth. Rationale:	CEAA EA is not required - NOT on Federal Lands		



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 2 of 7

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

Section C - Complete at site visit and enter on Site Visit screen in PATH

Date of Site Visit:

Visited by:

Who else was on site? (ie. Proponent representative, etc.)

Were photos taken or provided? (Note: Digital photos can be saved on the PATH Picture screen)

☐ Yes

☐ No

Was other data collected?

☐ Yes

☐ No

Is a Follow up Site Visit Required?

☐ Yes - Date for planned Follow up visit:

☐ No

General Observations - Enter a brief description (ie. weather, time of day, etc.)

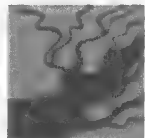


Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

Section C (Continued) - Enter on Compliance Monitoring screen in PATH

Work Status:

☐ Not Started ☒ In Progress ☐ Completed: ☐ Unknown

Section C - Authorization Issued

1. Were the proposed works/undertakings/activities completed as described in the authorization?

☐ Yes ☐ No ☐ Partial ☒ Unknown

works still in progress

2. Was the serious harm to fish as described in the authorization?

☐ Yes ☐ No ☐ Partial ☒ Unknown

works still in progress

3. If Species at Risk Act(SARA) conditions are included in the authorization, were the impacts on aquatic SARA species as described?

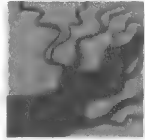
☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

4. Were the measures and standards to avoid and mitigate implemented as described in the authorization?

☒ Yes ☐ No ☐ Partial ☐ Unknown

5. Were the measures and standards to avoid and mitigate effective in preventing serious harm to fish or impacts to aquatic SARA species?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 4 of 7

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

6. If included in the authorization, were the contingency measures implemented?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

—

7. Were the contingency measures effective in preventing serious harm to fish or impacts to aquatic SARA species?

☐ Yes ☐ No ☐ Unknown ☒ Not Applicable

—

8. Were the offsetting measures implemented as described?

☐ Yes ☒ No ☐ Partial ☐ Unknown ☐ Not Applicable

offsetting measures to be completed post emergency works

—

9. Were the offsetting measures effective?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

—

10. How was the effectiveness of the measures assessed?

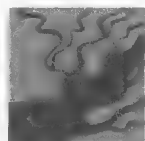
☐ Observational ☐ Functional ☐ Direct ☐ Other ☒ Not Applicable

—

Section C (Continued)

1. Is there a compliance issue with the Fisheries Act?

☐ Yes ☒ No ☐ Unknown



PATH

Compliance Monitoring Form

Authorization

Report Date:

Page 5 of 7

2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC

PATH No.: 16-HPAC-00732

Habitat File No.:

Receive Date:

2016/07/07

—

2. Is there a compliance issue with the Species at Risk Act?

☐ Yes

☒ No

☐ Unknown

—

3. Did the proponent notify DFO?

☒ Yes

☐ No

☐ Unknown

☐ Not Applicable

—

4. Select the section(s) of the Fisheries Act and/or the Species at Risk Act where non-compliance applies.

☐ FA21

☐ FA20

☐ FA35

☐ FA38

☐ Not Applicable

☐ SARA32

☐ SARA33

☐ SARA58

—

5. If there is a compliance issue with the Fisheries Act or the Species at Risk Act, will there be further compliance action recommended?

☐ Yes

☐ No

☐ Unknown

☒ Not Applicable

—



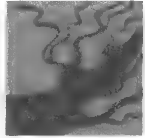
Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management

000155



PATH

Compliance Monitoring Form

Authorization

Report Date:

Page 6 of 7
2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

6. Is a follow up site visit required?

☐ Yes

☒ No

—

7. Is compliance monitoring now complete on this action?

☐ Yes

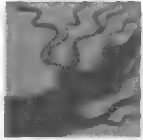
☒ No

—

Section D

Description:

Action Log:



PATH

Compliance Monitoring Form

Authorization

Page 7 of 7
Report Date: 2019/08/30

Title:	Stewart World Port Groyne Installation, Bear River, Stewart, BC		
PATH No.:	16-HPAC-00732	Habitat File No.:	Receive Date: 2016/07/07

Request for FA Authorization, Section 6 Factors, Approval Letter, Signed Authorization, Notes from Rebecca Reid

-----Original Message-----

From: Gebrehiwot, Awet
Sent: August-02-16 4:15 PM
To: Rotinsky, Brenda
Cc: Nutton, Byron; Seefried, Len
Subject: RE: 16-HPAC-00732 Stewart World Port Emergency Authorization

Hi Len and Byron,

Attached please find the signed Authorization.

I have also attached a couple of comments from RDG. Thank you, Awet

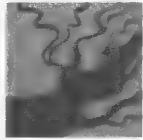
-----Original Message-----

From: Rotinsky, Brenda
Sent: July-29-16 4:19 PM
To: Gebrehiwot, Awet
Cc: Nutton, Byron; Seefried, Len
Subject: 16-HPAC-00732 Stewart World Port Emergency Authorization

Hi Awet,

As discussed, you have the complete package for processing the Emergency Authorization for the above noted project on Tuesday morning. It has finished the BI05 sign-off so is good to go right to the RDs office. When the Authorization is signed off, please send it to Byron and Len and cc me.

Thank you!
Brenda



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 1 of 7

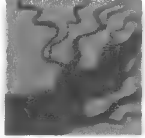
Title:	Stewart World Port Groyne Installation, Bear River, Stewart, BC		
PATH No.:	16-HPAC-00732	Habitat File No.:	Receive Date: 2016/07/07

Section A - PATH Main Information Screen

Category:			
Prop. Start:	2016/07/11	Prop. Completion:	2016/07/31
Assessor:	Mercer, Vance Fisheries Protection Program Biologist 200 - 401 Burrard Street Vancouver BC V6C 3S4 (604) 666-0280	Proponent:	Pettit, Brad Stewart World Port Services Ltd. 11421 Alaska Rd Fort St. John BC V1J 6N2
		Other Contact:	
Local Water:	Portland Canal at the mouth of the Bear River	Nearest Community:	Stewart
County / Municip.:	District of Stewart	Province / Territory:	British Columbia
Geo. Obj. Type:	Point	Latitude/Longitude:	55°55'04" 129°59'35"
Location Detail:	From Terrace, BC drive east to Kitwanga, drive north on highway 37 to Meziadin Junction, turn west on Highway 37a, drive to Stewart town site, and drive to the end of Railway St. to reach D17318 (Cassiar District).		
UTM Zone:	9	Decimal Latitude:	55.92
UTM Easting:	437927	Decimal Longitude:	-129.99
UTM Northing:	6197365		
<u>Act/Reg.</u>	<u>Para./Sec.</u>	<u>Act or Regulation</u>	<u>Paragraphs or Sections</u>

Section B - PATH Action Log Record

Action ID No.:	28	Action Date:	2016/08/02
Action:	Authorized - Fisheries Act Authorization Issued		
From:	Ω Gebrehiwot, Awet {x}	Effective Date:	2016/08/02
To:	Rotinsky, Brenda	Expiry Date:	2016/08/15
		Compensation:	<input checked="" type="checkbox"/>
Auth. Rationale:	CEAA EA is not required - NOT on Federal Lands		



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 2 of 7

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

Section C - Complete at site visit and enter on Site Visit screen in PATH

Date of Site Visit:

Visited by:

Who else was on site? (ie. Proponent representative, etc.)

Were photos taken or provided? (Note: Digital photos can be saved on the PATH Picture screen)

☐ Yes

☐ No

Was other data collected?

☐ Yes

☐ No

Is a Follow up Site Visit Required?

☐ Yes - Date for planned Follow up visit:

☐ No

General Observations - Enter a brief description (ie. weather, time of day, etc.)

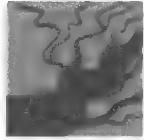


Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

Section C (Continued) - Enter on Compliance Monitoring screen in PATH

Work Status:

☐ Not Started ☐ In Progress ☒ Completed: ☐ Unknown

Section C - Authorization Issued

1. Were the proposed works/undertakings/activities completed as described in the authorization?

☐ Yes ☐ No ☐ Partial ☒ Unknown

Works completed, but waiting for submission of final summary monitoring report.

2. Was the serious harm to fish as described in the authorization?

☐ Yes ☐ No ☐ Partial ☒ Unknown

Works completed, but waiting for submission of final summary monitoring report.

3. If Species at Risk Act(SARA) conditions are included in the authorization, were the impacts on aquatic SARA species as described?

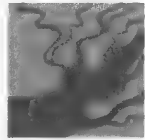
☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

4. Were the measures and standards to avoid and mitigate implemented as described in the authorization?

☒ Yes ☐ No ☐ Partial ☐ Unknown

5. Were the measures and standards to avoid and mitigate effective in preventing serious harm to fish or impacts to aquatic SARA species?

☒ Yes ☐ No ☐ Partial ☐ Unknown ☐ Not Applicable



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 4 of 7

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

6. If included in the authorization, were the contingency measures implemented?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

-

7. Were the contingency measures effective in preventing serious harm to fish or impacts to aquatic SARA species?

☐ Yes ☐ No ☐ Unknown ☒ Not Applicable

-

8. Were the offsetting measures implemented as described?

☐ Yes ☒ No ☐ Partial ☐ Unknown ☐ Not Applicable

Offsetting measures to be implemented post emergency authorization construction of works.

9. Were the offsetting measures effective?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

-

10. How was the effectiveness of the measures assessed?

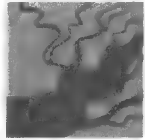
☐ Observational ☐ Functional ☐ Direct ☐ Other ☒ Not Applicable

-

Section C (Continued)

1. Is there a compliance issue with the Fisheries Act?

☐ Yes ☒ No ☐ Unknown



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

—

2. Is there a compliance issue with the Species at Risk Act?

☐ Yes

☒ No

☐ Unknown

—

3. Did the proponent notify DFO?

☒ Yes

☐ No

☐ Unknown

☐ Not Applicable

—

4. Select the section(s) of the Fisheries Act and/or the Species at Risk Act where non-compliance applies.

☐ FA21

☐ FA20

☐ FA35

☐ FA38

☐ Not Applicable

☐ SARA32

☐ SARA33

☐ SARA58

—

5. If there is a compliance issue with the Fisheries Act or the Species at Risk Act, will there be further compliance action recommended?

☐ Yes

☐ No

☐ Unknown

☒ Not Applicable

—

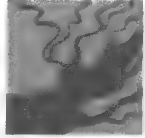


Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management



PATH

Compliance Monitoring Form

Authorization

Report Date:

Page 6 of 7
2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

6. Is a follow up site visit required?

☐ Yes

☒ No

7. Is compliance monitoring now complete on this action?

☐ Yes

☒ No

waiting for final summary environmental monitoring report to be submitted for review

Section D

Description:

Action Log:

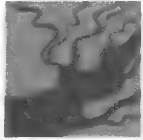


Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 7 of 7

Title:	Stewart World Port Groyne Installation, Bear River, Stewart, BC			Receive Date:	2016/07/07
PATH No.:	16-HPAC-00732	Habitat File No.:			

Request for FA Authorization, Section 6 Factors, Approval Letter, Signed Authorization, Notes from Rebecca Reid

-----Original Message-----

From: Gebrehiwot, Awet
Sent: August-02-16 4:15 PM
To: Rotinsky, Brenda
Cc: Nutton, Byron; Seefried, Len
Subject: RE: 16-HPAC-00732 Stewart World Port Emergency Authorization

Hi Len and Byron,

Attached please find the signed Authorization.

I have also attached a couple of comments from RDG. Thank you, Awet

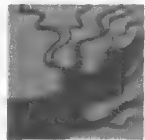
-----Original Message-----

From: Rotinsky, Brenda
Sent: July-29-16 4:19 PM
To: Gebrehiwot, Awet
Cc: Nutton, Byron; Seefried, Len
Subject: 16-HPAC-00732 Stewart World Port Emergency Authorization

Hi Awet,

As discussed, you have the complete package for processing the Emergency Authorization for the above noted project on Tuesday morning. It has finished the BI05 sign-off so is good to go right to the RDs office. When the Authorization is signed off, please send it to Byron and Len and cc me.

Thank you!
Brenda



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 1 of 7

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
 PATH No.: 16-HPAC-00732 Habitat File No.: Receive Date: 2016/07/07

Section A - PATH Main Information Screen

Category:			
Prop. Start:	2016/07/11	Prop. Completion:	2016/07/31
Assessor:	Mercer, Vance Fisheries Protection Program Biologist 200 - 401 Burrard Street Vancouver BC V6C 3S4 (604) 666-0280	Proponent:	Pettit, Brad Stewart World Port Services Ltd. 11421 Alaska Rd Fort St. John BC V1J 6N2
		Other Contact:	
Local Water:	Portland Canal at the mouth of the Bear River	Nearest Community:	Stewart
County / Municipality:	District of Stewart	Province / Territory:	British Columbia
Geo. Obj. Type:	Point	Latitude/Longitude:	55°55'04" 129°59'35"
Location Detail:	From Terrace, BC drive east to Kitwanga, drive north on highway 37 to Meziadin Junction, turn west on Highway 37a, drive to Stewart town site, and drive to the end of Railway St. to reach D17318 (Cassiar District).		
UTM Zone:	9	Decimal Latitude:	55.92
UTM Easting:	437927	Decimal Longitude:	-129.99
UTM Northing:	6197365		
<u>Act/Reg.</u>	<u>Para./Sec.</u>	<u>Act or Regulation</u>	<u>Paragraphs or Sections</u>

Section B - PATH Action Log Record

Action ID No.:	28	Action Date:	2016/08/02
Action:	Authorized - Fisheries Act Authorization Issued		
From:	Q Gebrehiwot, Awet {x}	Effective Date:	2016/08/02
To:	Rotinsky, Brenda	Expiry Date:	2016/08/15
		Compensation:	<input checked="" type="checkbox"/>
Auth. Rationale:	CEAA EA is not required - NOT on Federal Lands		

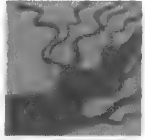


Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details.

Habitat Management



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 2 of 7

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

Section C - Complete at site visit and enter on Site Visit screen in PATH

Date of Site Visit:

Visited by:

Who else was on site? (ie. Proponent representative, etc.)

Were photos taken or provided? (Note: Digital photos can be saved on the PATH Picture screen)

☐ Yes

☐ No

Was other data collected?

☐ Yes

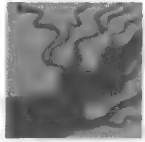
☐ No

Is a Follow up Site Visit Required?

☐ Yes - Date for planned Follow up visit:

☐ No

General Observations - Enter a brief description (ie. weather, time of day, etc.)



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

Section C (Continued) - Enter on Compliance Monitoring screen in PATH

Work Status:

☐ Not Started ☒ In Progress ☐ Completed: ☐ Unknown

Section C - Authorization Issued

1. Were the proposed works/undertakings/activities completed as described in the authorization?

☒ Yes ☐ No ☐ Partial ☐ Unknown

—

2. Was the serious harm to fish as described in the authorization?

☐ Yes ☐ No ☒ Partial ☐ Unknown

Destruction of fish habitat documented as per Authorization. Permanent alteration of estuarine habitat due to changes of flow and sediment deposition needs to be assessed as per monitoring conditions of authorization.

3. If Species at Risk Act(SARA) conditions are included in the authorization, were the impacts on aquatic SARA species as described?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

—

4. Were the measures and standards to avoid and mitigate implemented as described in the authorization?

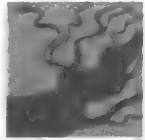
☒ Yes ☐ No ☐ Partial ☐ Unknown

—

5. Were the measures and standards to avoid and mitigate effective in preventing serious harm to fish or impacts to aquatic SARA species?

☒ Yes ☐ No ☐ Partial ☐ Unknown ☐ Not Applicable

—



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 4 of 7

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

6. If included in the authorization, were the contingency measures implemented?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

—

7. Were the contingency measures effective in preventing serious harm to fish or impacts to aquatic SARA species?

☐ Yes ☐ No ☐ Unknown ☒ Not Applicable

—

8. Were the offsetting measures implemented as described?

☐ Yes ☐ No ☐ Partial ☒ Unknown ☐ Not Applicable

Due to emergency nature of authorization, Offsetting Plan due January 30, 2017.

9. Were the offsetting measures effective?

☐ Yes ☐ No ☐ Partial ☒ Unknown ☐ Not Applicable

—

10. How was the effectiveness of the measures assessed?

☐ Observational ☐ Functional ☐ Direct ☐ Other ☒ Not Applicable

—

Section C (Continued)

1. Is there a compliance issue with the Fisheries Act?

☐ Yes ☒ No ☐ Unknown

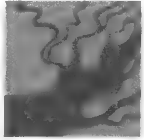


Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

—

2. Is there a compliance issue with the Species at Risk Act?

☐ Yes

☒ No

☐ Unknown

—

3. Did the proponent notify DFO?

☐ Yes

☐ No

☐ Unknown

☒ Not Applicable

—

4. Select the section(s) of the Fisheries Act and/or the Species at Risk Act where non-compliance applies.

☐ FA21

☐ FA20

☐ FA35

☐ FA38

☐ Not Applicable

☐ SARA32

☐ SARA33

☐ SARA58

—

5. If there is a compliance issue with the Fisheries Act or the Species at Risk Act, will there be further compliance action recommended?

☐ Yes

☐ No

☐ Unknown

☒ Not Applicable

—

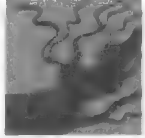


Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 6 of 7

Title:	Stewart World Port Groyne Installation, Bear River, Stewart, BC		
PATH No.:	16-HPAC-00732	Habitat File No.:	Receive Date: 2016/07/07

6. Is a follow up site visit required?

☒ Yes ☐ No

Site visit should occur post offsetting construction in 2017.

7. Is compliance monitoring now complete on this action?

☐ Yes ☒ No

—

Section D

Description:

Action Log:



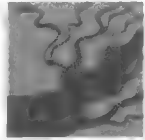
Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management

000170



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 7 of 7

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

Request for FA Authorization, Section 6 Factors, Approval Letter, Signed Authorization, Notes from Rebecca Reid

-----Original Message-----

From: Gebrehiwot, Awet
Sent: August-02-16 4:15 PM
To: Rotinsky, Brenda
Cc: Nutton, Byron; Seefried, Len
Subject: RE: 16-HPAC-00732 Stewart World Port Emergency Authorization

Hi Len and Byron,

Attached please find the signed Authorization.

I have also attached a couple of comments from RDG. Thank you, Awet

-----Original Message-----

From: Rotinsky, Brenda
Sent: July-29-16 4:19 PM
To: Gebrehiwot, Awet
Cc: Nutton, Byron; Seefried, Len
Subject: 16-HPAC-00732 Stewart World Port Emergency Authorization

Hi Awet,

As discussed, you have the complete package for processing the Emergency Authorization for the above noted project on Tuesday morning. It has finished the BIO5 sign-off so is good to go right to the RDs office. When the Authorization is signed off, please send it to Byron and Len and cc me.

Thank you!

Brenda



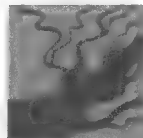
Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management

000171



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 1 of 7

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
 PATH No.: 16-HPAC-00732 Habitat File No.: Receive Date: 2016/07/07

Section A - PATH Main Information Screen

Category:			
Prop. Start:	2016/07/11	Prop. Completion:	2016/07/31
Assessor:	Mercer, Vance Fisheries Protection Program Biologist 200 - 401 Burrard Street Vancouver BC V6C 3S4 (604) 666-0280	Proponent:	Pettit, Brad Stewart World Port Services Ltd. 11421 Alaska Rd Fort St. John BC V1J 6N2
		Other Contact:	
Local Water:	Portland Canal at the mouth of the Bear River	Nearest Community:	Stewart
County / Municip.:	District of Stewart	Province / Territory:	British Columbia
Geo. Obj. Type:	Point	Latitude/Longitude:	55°55'04'' 129°59'35''
Location Detail:	From Terrace, BC drive east to Kitwanga, drive north on highway 37 to Meziadin Junction, turn west on Highway 37a, drive to Stewart town site, and drive to the end of Railway St. to reach D17318 (Cassiar District).		
UTM Zone:	9	Decimal Latitude:	55.92
UTM Easting:	437927	Decimal Longitude:	-129.99
UTM Northing:	6197365		

<u>Act/Reg.</u>	<u>Para./Sec.</u>	<u>Act or Regulation</u>	<u>Paragraphs or Sections</u>
-----------------	-------------------	--------------------------	-------------------------------

Section B - PATH Action Log Record

Action ID No.:	28	Action Date:	2016/08/02
Action:	Authorized - Fisheries Act Authorization Issued		
From:	Ω Gebrehiwot, Awet {x}	Effective Date:	2016/08/02
To:	Rotinsky, Brenda	Expiry Date:	2016/08/15
		Compensation:	<input checked="" type="checkbox"/>
Auth. Rationale:	CEAA EA is not required - NOT on Federal Lands		

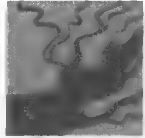


Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management



PATH

Compliance Monitoring Form

Authorization

Report Date:

Page 2 of 7

2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC

PATH No.: 16-HPAC-00732

Habitat File No.:

Receive Date:

2016/07/07

Section C - Complete at site visit and enter on Site Visit screen in PATH

Date of Site Visit:

Visited by:

Who else was on site? (ie. Proponent representative, etc.)

Were photos taken or provided? (Note: Digital photos can be saved on the PATH Picture screen)

☐ Yes

☐ No

Was other data collected?

☐ Yes

☐ No

Is a Follow up Site Visit Required?

☐ Yes - Date for planned Follow up visit:

☐ No

General Observations - Enter a brief description (ie. weather, time of day, etc.)



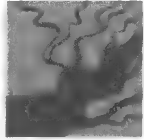
Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management

000173



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

Section C (Continued) - Enter on Compliance Monitoring screen in PATH

Work Status:

☐ Not Started ☒ In Progress ☐ Completed: ☐ Unknown

Section C - Authorization Issued

1. Were the proposed works/undertakings/activities completed as described in the authorization?

☒ Yes ☐ No ☐ Partial ☐ Unknown

-

2. Was the serious harm to fish as described in the authorization?

☐ Yes ☐ No ☒ Partial ☐ Unknown

Destruction of fish habitat from infilling as proposed. Permanent alteration of estuarine habitat will be assessed via future monitoring activities.

3. If Species at Risk Act(SARA) conditions are included in the authorization, were the impacts on aquatic SARA species as described?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

-

4. Were the measures and standards to avoid and mitigate implemented as described in the authorization?

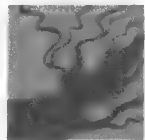
☒ Yes ☐ No ☐ Partial ☐ Unknown

-

5. Were the measures and standards to avoid and mitigate effective in preventing serious harm to fish or impacts to aquatic SARA species?

☒ Yes ☐ No ☐ Partial ☐ Unknown ☐ Not Applicable

-



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 4 of 7

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

6. If included in the authorization, were the contingency measures implemented?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

—

7. Were the contingency measures effective in preventing serious harm to fish or impacts to aquatic SARA species?

☐ Yes ☐ No ☐ Unknown ☒ Not Applicable

—

8. Were the offsetting measures implemented as described?

☐ Yes ☐ No ☐ Partial ☒ Unknown ☐ Not Applicable

Due to emergency nature of authorization, Final Offsetting Plan due January 30, 2017

9. Were the offsetting measures effective?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

—

10. How was the effectiveness of the measures assessed?

☐ Observational ☐ Functional ☐ Direct ☐ Other ☒ Not Applicable

—

Section C (Continued)

1. Is there a compliance issue with the Fisheries Act?

☐ Yes ☒ No ☐ Unknown



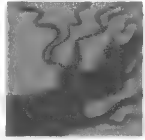
Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details.

Habitat Management

000175



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 5 of 7

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.: Receive Date: 2016/07/07

—

2. Is there a compliance issue with the Species at Risk Act?

☐ Yes ☒ No ☐ Unknown

—

3. Did the proponent notify DFO?

☐ Yes ☐ No ☐ Unknown ☒ Not Applicable

—

4. Select the section(s) of the Fisheries Act and/or the Species at Risk Act where non-compliance applies.

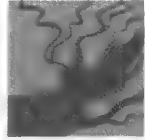
☐ FA21 ☐ FA20 ☐ FA35 ☐ FA38 ☐ Not Applicable
☐ SARA32 ☐ SARA33 ☐ SARA58

—

5. If there is a compliance issue with the Fisheries Act or the Species at Risk Act, will there be further compliance action recommended?

☐ Yes ☐ No ☐ Unknown ☒ Not Applicable

—



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 6 of 7

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

6. Is a follow up site visit required?

☒ Yes ☐ No

Site visit post offsetting construction warranted in 2017.

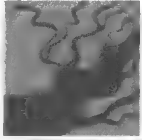
7. Is compliance monitoring now complete on this action?

☐ Yes ☒ No

Section D

Description:

Action Log:



PATH

Compliance Monitoring Form

Authorization

Report Date: Page 7 of 7
2019/08/30

Title:	Stewart World Port Groyne Installation, Bear River, Stewart, BC		
PATH No.:	16-HPAC-00732	Habitat File No.:	Receive Date: 2016/07/07

Request for FA Authorization, Section 6 Factors, Approval Letter, Signed Authorization, Notes from Rebecca Reid

-----Original Message-----

From: Gebrehiwot, Awet
Sent: August-02-16 4:15 PM
To: Rotinsky, Brenda
Cc: Nutton, Byron; Seefried, Len
Subject: RE: 16-HPAC-00732 Stewart World Port Emergency Authorization

Hi Len and Byron,

Attached please find the signed Authorization.

I have also attached a couple of comments from RDG. Thank you, Awet

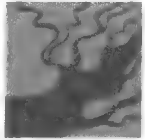
-----Original Message-----

From: Rotinsky, Brenda
Sent: July-29-16 4:19 PM
To: Gebrehiwot, Awet
Cc: Nutton, Byron; Seefried, Len
Subject: 16-HPAC-00732 Stewart World Port Emergency Authorization

Hi Awet,

As discussed, you have the complete package for processing the Emergency Authorization for the above noted project on Tuesday morning. It has finished the BI05 sign-off so is good to go right to the RDs office. When the Authorization is signed off, please send it to Byron and Len and cc me.

Thank you!
Brenda



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 1 of 7

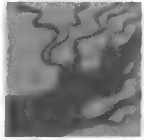
Title:	Stewart World Port Groyne Installation, Bear River, Stewart, BC		
PATH No.:	16-HPAC-00732	Habitat File No.:	Receive Date: 2016/07/07

Section A - PATH Main Information Screen

Category:			
Prop. Start:	2016/07/11	Prop. Completion:	2016/07/31
Assessor:	Mercer, Vance Fisheries Protection Program Biologist 200 - 401 Burrard Street Vancouver BC V6C 3S4 (604) 666-0280	Proponent:	Pettit, Brad Stewart World Port Services Ltd. 11421 Alaska Rd Fort St. John BC V1J 6N2
		Other Contact:	
Local Water:	Portland Canal at the mouth of the Bear River	Nearest Community:	Stewart
County / Municip.:	District of Stewart	Province / Territory:	British Columbia
Geo. Obj. Type:	Point	Latitude/Longitude:	55°55'04" 129°59'35"
Location Detail:	From Terrace, BC drive east to Kitwanga, drive north on highway 37 to Meziadin Junction, turn west on Highway 37a, drive to Stewart town site, and drive to the end of Railway St. to reach D17318 (Cassiar District).	Legal Description:	
UTM Zone:	9	Decimal Latitude:	55.92
UTM Easting:	437927	Decimal Longitude:	-129.99
UTM Northing:	6197365		
<u>Act/Reg.</u>	<u>Para./Sec.</u>	<u>Act or Regulation</u>	<u>Paragraphs or Sections</u>

Section B - PATH Action Log Record

Action ID No.:	28	Action Date:	2016/08/02
Action:	Authorized - Fisheries Act Authorization Issued		
From:	Ω Gebrehiwot, Awet {x}	Effective Date:	2016/08/02
To:	Rotinsky, Brenda	Expiry Date:	2016/08/15
		Compensation:	<input checked="" type="checkbox"/>
Auth. Rationale:	CEAA EA is not required - NOT on Federal Lands		



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 2 of 7

Title:	Stewart World Port Groyne Installation, Bear River, Stewart, BC		
PATH No.:	16-HPAC-00732	Habitat File No.:	Receive Date: 2016/07/07

Section C - Complete at site visit and enter on Site Visit screen in PATH

Date of Site Visit: 2017/01/31 Visited by: Barber, Boone
Talbot, Renny

Who else was on site? (ie. Proponent representative, etc.) _____

Were photos taken or provided? (Note: Digital photos can be saved on the PATH Picture screen)

☒ Yes ☐ No

Was other data collected?

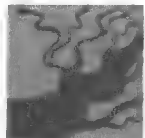
☒ Yes ☐ No

Is a Follow up Site Visit Required?

☐ Yes - Date for planned Follow up visit: _____ ☒ No

General Observations - Enter a brief description (ie. weather, time of day, etc.)

Site visit conducted of the groyne to review footprint. The riprap groyne was constructed in August 2016 and is an extension of an existing groyne. Photographs, field sketch and gps waypoints are available in the project folder.



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

Section C (Continued) - Enter on Compliance Monitoring screen in PATH

Work Status:

☐ Not Started ☒ In Progress ☐ Completed: ☐ Unknown

Section C - Authorization Issued

1. Were the proposed works/undertakings/activities completed as described in the authorization?

☐ Yes ☐ No ☒ Partial ☐ Unknown

The groyne footprint is smaller than what was authorized; however, overall the configuration and location is as proposed.

2. Was the serious harm to fish as described in the authorization?

☐ Yes ☐ No ☒ Partial ☐ Unknown

The footprint is smaller resulting in less destruction.

3. If Species at Risk Act(SARA) conditions are included in the authorization, were the impacts on aquatic SARA species as described?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

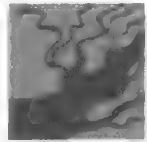
4. Were the measures and standards to avoid and mitigate implemented as described in the authorization?

☐ Yes ☐ No ☐ Partial ☒ Unknown

Construction was completed in August 2016. Monitoring was not able to assess mitigation measures during construction.

5. Were the measures and standards to avoid and mitigate effective in preventing serious harm to fish or impacts to aquatic SARA species?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

6. If included in the authorization, were the contingency measures implemented?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

7. Were the contingency measures effective in preventing serious harm to fish or impacts to aquatic SARA species?

☐ Yes ☐ No ☐ Unknown ☒ Not Applicable

Construction was completed in August 2016. Monitoring was not able to assess contingency measures during construction.

8. Were the offsetting measures implemented as described?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

Offset has not been construction yet. It is proposed from February 15 to March 31, 2017.

9. Were the offsetting measures effective?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

Offset has not been construction yet. It is proposed from February 15 to March 31, 2017.

10. How was the effectiveness of the measures assessed?

☐ Observational ☐ Functional ☐ Direct ☐ Other ☒ Not Applicable

Construction complete and offset has not been constructed. Monitors were looking at the footprint of the groyne.

Section C (Continued)

1. Is there a compliance issue with the Fisheries Act?

☐ Yes ☒ No ☐ Unknown

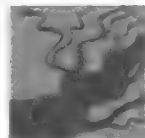


Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management



PATH

Compliance Monitoring Form

Authorization

Report Date:

Page 5 of 7
2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC

PATH No.: 16-HPAC-00732

Habitat File No.:

Receive Date:

2016/07/07

—

2. Is there a compliance issue with the Species at Risk Act?

☐ Yes

☒ No

☐ Unknown

—

3. Did the proponent notify DFO?

☐ Yes

☐ No

☐ Unknown

☒ Not Applicable

—

4. Select the section(s) of the Fisheries Act and/or the Species at Risk Act where non-compliance applies.

☐ FA21

☐ FA20

☐ FA35

☐ FA38

☐ Not Applicable

☐ SARA32

☐ SARA33

☐ SARA58

—

5. If there is a compliance issue with the Fisheries Act or the Species at Risk Act, will there be further compliance action recommended?

☐ Yes

☐ No

☐ Unknown

☒ Not Applicable

—

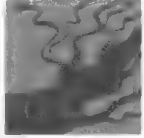


Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 6 of 7

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

6. Is a follow up site visit required?

☐ Yes

☒ No

7. Is compliance monitoring now complete on this action?

☐ Yes

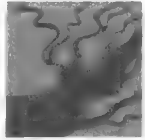
☒ No

Offset is not constructed. It is proposed to be constructed February 15 to March 31, 2017

Section D

Description:

Action Log:



PATH

Compliance Monitoring Form

Authorization

Report Date: Page 7 of 7
2019/08/30

Title:	Stewart World Port Groyne Installation, Bear River, Stewart, BC		
PATH No.:	16-HPAC-00732	Habitat File No.:	Receive Date: 2016/07/07

Request for FA Authorization, Section 6 Factors, Approval Letter, Signed Authorization, Notes from Rebecca Reid

-----Original Message-----

From: Gebrehiwot, Awet
Sent: August-02-16 4:15 PM
To: Rotinsky, Brenda
Cc: Nutton, Byron; Seefried, Len
Subject: RE: 16-HPAC-00732 Stewart World Port Emergency Authorization

Hi Len and Byron,

Attached please find the signed Authorization.

I have also attached a couple of comments from RDG. Thank you, Awet

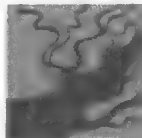
-----Original Message-----

From: Rotinsky, Brenda
Sent: July-29-16 4:19 PM
To: Gebrehiwot, Awet
Cc: Nutton, Byron; Seefried, Len
Subject: 16-HPAC-00732 Stewart World Port Emergency Authorization

Hi Awet,

As discussed, you have the complete package for processing the Emergency Authorization for the above noted project on Tuesday morning. It has finished the BIO5 sign-off so is good to go right to the RDs office. When the Authorization is signed off, please send it to Byron and Len and cc me.

Thank you!
Brenda



PATH

Compliance Monitoring Form

Authorization

Page 1 of 7
Report Date: 2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.: Receive Date: 2016/07/07

Section A - PATH Main Information Screen

Category:
Prop. Start: 2016/07/11 Prop. Completion: 2016/07/31

Assessor: Mercer, Vance Fisheries Protection Program Biologist
200 - 401 Burrard Street
Vancouver BC
V6C 3S4 (604) 666-0280

Proponent: Pettit, Brad
Stewart World Port Services Ltd.
11421 Alaska Rd
Fort St. John BC
V1J 6N2

Other Contact:

Local Water: Portland Canal at the mouth of the Bear River
County / Municip.: District of Stewart
Geo. Obj. Type: Point
Location Detail: From Terrace, BC drive east to Kitwanga, drive north on highway 37 to Meziadin Junction, turn west on Highway 37a, drive to Stewart town site, and drive to the end of Railway St. to reach D17318 (Cassiar District).

Nearest Community: Stewart
Province / Territory: British Columbia
Latitude/Longitude: 55°55' 04" 129°59' 35"

Legal Description:

UTM Zone: 9
UTM Easting: 437927
UTM Northing: 6197365

Decimal Latitude: 55.92
Decimal Longitude: -129.99

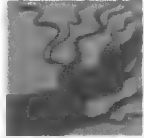
Act/Reg. Para./Sec. Act or Regulation Paragraphs or Sections

Section B - PATH Action Log Record

Action ID No.: 28 Action Date: 2016/08/02
Action: Authorized - Fisheries Act Authorization Issued

From: Ω Gebrehiwot, Awet {x} Effective Date: 2016/08/02
To: Rotinsky, Brenda Expiry Date: 2016/08/15
Compensation: ☒

Auth. Rationale: CEAA EA is not required - NOT on Federal Lands



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 2 of 7

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

Section C - Complete at site visit and enter on Site Visit screen in PATH

Date of Site Visit: 2017/07/31 Visited by: Barber, Boone
Talbot, Renny
Who else was on site? (ie. Proponent representative, etc.) Chow, Darren

Were photos taken or provided? (Note: Digital photos can be saved on the PATH Picture screen)

☐ Yes ☒ No

Was other data collected?

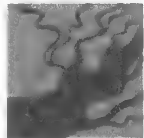
☐ Yes ☒ No

Is a Follow up Site Visit Required?

☐ Yes - Date for planned Follow up visit: ☒ No

General Observations - Enter a brief description (ie. weather, time of day, etc.)

Site visit conducted by Boone Barber, Darren Chow and Renny Talbot of FPP to look at offsets. Photographs were taken of the site for comparison to the offsetting as-built figure to the site. During this site visit newly placed large woody debris was observed to be placed in Parcel B, an upstream offset location proposed under 17-hpac-00206. Offset measures have not been reviewed or approved by FPP for 17-hpac-00206. FPP verified that the twin perched culverts observed in January 2017 were replaced with a single arch culvert. Met with Brad Pettit while on site. He stated that marine dredging in the vicinity of the port will likely be necessary soon.



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

Section C (Continued) - Enter on Compliance Monitoring screen in PATH

Work Status:

☐ Not Started ☐ In Progress ☒ Completed: ☐ Unknown

Section C - Authorization Issued

1. Were the proposed works/undertakings/activities completed as described in the authorization?

☐ Yes ☐ No ☐ Partial ☒ Unknown

not assessed in this monitoring form. this monitoring is for offset.

2. Was the serious harm to fish as described in the authorization?

☐ Yes ☐ No ☐ Partial ☒ Unknown

This monitoring form is for offset construction. No serious harm to fish observed at the offset location.

3. If Species at Risk Act(SARA) conditions are included in the authorization, were the impacts on aquatic SARA species as described?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

4. Were the measures and standards to avoid and mitigate implemented as described in the authorization?

☐ Yes ☐ No ☐ Partial ☒ Unknown

Site visit was to look at offsets. not to asses measures and standards.

5. Were the measures and standards to avoid and mitigate effective in preventing serious harm to fish or impacts to aquatic SARA species?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

not applicable to this monitoring event. this will be assessed during as-built report review.

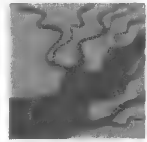


Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 4 of 7

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

6. If included in the authorization, were the contingency measures implemented?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

not applicable to this monitoring event. this will be assessed during as-built report review.

7. Were the contingency measures effective in preventing serious harm to fish or impacts to aquatic SARA species?

☐ Yes ☐ No ☐ Unknown ☒ Not Applicable

not applicable to this monitoring event. this will be assessed during as-built report review.

8. Were the offsetting measures implemented as described?

☐ Yes ☐ No ☒ Partial ☐ Unknown ☐ Not Applicable

Offsets appear to be built as described in the approved offset plan. There is a substantial amount of habitat complexing features that have been constructed beyond what was proposed in the offsetting plan. Need to review the as-built report to understand the details of whether they met the requirements.

9. Were the offsetting measures effective?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

not assessing the effectiveness of the measures during this site visit. Took photographs to determine what was built.

10. How was the effectiveness of the measures assessed?

☒ Observational ☐ Functional ☐ Direct ☐ Other ☐ Not Applicable

—

Section C (Continued)

1. Is there a compliance issue with the Fisheries Act?

☐ Yes ☒ No ☐ Unknown

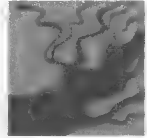


Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 5 of 7

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

—

2. Is there a compliance issue with the Species at Risk Act?

☐ Yes

☒ No

☐ Unknown

—

3. Did the proponent notify DFO?

☐ Yes

☐ No

☐ Unknown

☒ Not Applicable

—

4. Select the section(s) of the Fisheries Act and/or the Species at Risk Act where non-compliance applies.

☐ FA21

☐ FA20

☐ FA35

☐ FA38

☐ Not Applicable

☐ SARA32

☐ SARA33

☐ SARA58

—

5. If there is a compliance issue with the Fisheries Act or the Species at Risk Act, will there be further compliance action recommended?

☐ Yes

☐ No

☐ Unknown

☒ Not Applicable

—

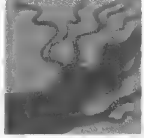


Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

6. Is a follow up site visit required?

☐ Yes

☒ No

7. Is compliance monitoring now complete on this action?

☐ Yes

☒ No

Effectiveness monitoring will be conducted in 2018, 2020 and 2022.

Section D

Description:

Action Log:

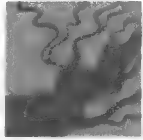


Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management



PATH

Compliance Monitoring Form

Authorization

Report Date: Page 7 of 7
2019-08-30

Title:	Stewart World Port Groyne Installation, Bear River, Stewart, BC		
PATH No.:	16-HPAC-00732	Habitat File No.:	Receive Date: 2016/07/07

Request for FA Authorization, Section 6 Factors, Approval Letter, Signed Authorization, Notes from Rebecca Reid

-----Original Message-----

From: Gebrehiwot, Awet
Sent: August-02-16 4:15 PM
To: Rotinsky, Brenda
Cc: Nutton, Byron; Seefried, Len
Subject: RE: 16-HPAC-00732 Stewart World Port Emergency Authorization

Hi Len and Byron,

Attached please find the signed Authorization.

I have also attached a couple of comments from RDG. Thank you, Awet

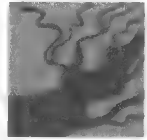
-----Original Message-----

From: Rotinsky, Brenda
Sent: July-29-16 4:19 PM
To: Gebrehiwot, Awet
Cc: Nutton, Byron; Seefried, Len
Subject: 16-HPAC-00732 Stewart World Port Emergency Authorization

Hi Awet,

As discussed, you have the complete package for processing the Emergency Authorization for the above noted project on Tuesday morning. It has finished the BI05 sign-off so is good to go right to the RDs office. When the Authorization is signed off, please send it to Byron and Len and cc me.

Thank you!
Brenda



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 1 of 7

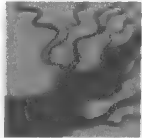
Title:	Stewart World Port Groyne Installation, Bear River, Stewart, BC		
PATH No.:	16-HPAC-00732	Habitat File No.:	Receive Date: 2016/07/07

Section A - PATH Main Information Screen

Category:			
Prop. Start:	2016/07/11	Prop. Completion:	2016/07/31
Assessor:	Mercer, Vance Fisheries Protection Program Biologist 200 - 401 Burrard Street Vancouver BC V6C 3S4 (604) 666-0280	Proponent:	Pettit, Brad Stewart World Port Services Ltd. 11421 Alaska Rd Fort St. John BC V1J 6N2
		Other Contact:	
Local Water:	Portland Canal at the mouth of the Bear River	Nearest Community:	Stewart
County / Municip.:	District of Stewart	Province / Territory:	British Columbia
Geo. Obj. Type:	Point	Latitude/Longitude:	55°55'04" 129°59'35"
Location Detail:	From Terrace, BC drive east to Kitwanga, drive north on highway 37 to Meziadin Junction, turn west on Highway 37a, drive to Stewart town site, and drive to the end of Railway St. to reach D17318 (Cassiar District).	Legal Description:	
UTM Zone:	9	Decimal Latitude:	55.92
UTM Easting:	437927	Decimal Longitude:	-129.99
UTM Northing:	6197365		
<u>Act/Reg.</u>	<u>Para./Sec.</u>	<u>Act or Regulation</u>	<u>Paragraphs or Sections</u>

Section B - PATH Action Log Record

Action ID No.:	28	Action Date:	2016/08/02
Action:	Authorized - Fisheries Act Authorization Issued		
From:	Q Gebrehiwot, Awet {x}	Effective Date:	2016/08/02
To:	Rotinsky, Brenda	Expiry Date:	2016/08/15
		Compensation:	<input checked="" type="checkbox"/>
Auth. Rationale:	CEAA EA is not required - NOT on Federal Lands		



PATH

Compliance Monitoring Form

Authorization

Report Date:

Page 2 of 7
2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

Section C - Complete at site visit and enter on Site Visit screen in PATH

Date of Site Visit:

Visited by:

Who else was on site? (ie. Proponent representative, etc.)

Were photos taken or provided? (Note: Digital photos can be saved on the PATH Picture screen)

☐ Yes

☐ No

Was other data collected?

☐ Yes

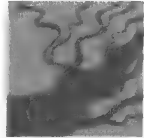
☐ No

Is a Follow up Site Visit Required?

☐ Yes - Date for planned Follow up visit:

☐ No

General Observations - Enter a brief description (ie. weather, time of day, etc.)



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

Section C (Continued) - Enter on Compliance Monitoring screen in PATH

Work Status:

☐ Not Started ☐ In Progress ☒ Completed: ☐ Unknown

Section C - Authorization Issued

1. Were the proposed works/undertakings/activities completed as described in the authorization?

☐ Yes ☐ No ☒ Partial ☐ Unknown

This w/u/a were not assessed.

2. Was the serious harm to fish as described in the authorization?

☐ Yes ☐ No ☐ Partial ☒ Unknown

Serious harm to fish as described in the authorization was not assessed. This monitoring form is in regards to offset construction. No serious harm to fish was observed at the offset site.

3. If Species at Risk Act(SARA) conditions are included in the authorization, were the impacts on aquatic SARA species as described?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

4. Were the measures and standards to avoid and mitigate implemented as described in the authorization?

☒ Yes ☐ No ☐ Partial ☐ Unknown

Fish salvage and isolation was conducted. Turbidity monitoring was conducted. No measurable spills or leaks reported. Works not conducted during least risk window; however, FPP amended the authorization for offset construction to work outside of least risk window. No other measures were included in the construction environmental monitoring report.

5. Were the measures and standards to avoid and mitigate effective in preventing serious harm to fish or impacts to aquatic SARA species?

☒ Yes ☐ No ☐ Partial ☐ Unknown ☐ Not Applicable

No fish mortalities.



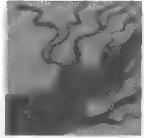
Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management

000195



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

6. If included in the authorization, were the contingency measures implemented?

☐ Yes ☐ No ☐ Partial ☒ Unknown ☐ Not Applicable

No statement whether contingency measures were implemented.

7. Were the contingency measures effective in preventing serious harm to fish or impacts to aquatic SARA species?

☐ Yes ☐ No ☒ Unknown ☐ Not Applicable

-

8. Were the offsetting measures implemented as described?

☐ Yes ☐ No ☒ Partial ☐ Unknown ☐ Not Applicable

SWP submitted this report as a post-construction/as-built report. This report is more of a construction environmental monitoring report and fisheries baseline report rather than an as-built report. A habitat balance table is needed as per the offsetting plan to compare the offset measures to those proposed in the offset plan. There is some differences between the offset as-built figure and the figure proposed in the offset plan. Additionally, the offset as-built figure is difficult to compare to the figure proposed in the offsetting plan as they are displayed differently.

9. Were the offsetting measures effective?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

not assessing effectiveness of offset measures.

10. How was the effectiveness of the measures assessed?

☒ Observational ☐ Functional ☐ Direct ☐ Other ☐ Not Applicable

-

Section C (Continued)

1. Is there a compliance issue with the Fisheries Act?

☐ Yes ☒ No ☐ Unknown

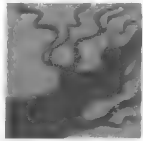


Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732

Habitat File No.:

Receive Date: 2016/07/07

—

2. Is there a compliance issue with the Species at Risk Act?

☐ Yes

☒ No

☐ Unknown

—

3. Did the proponent notify DFO?

☐ Yes

☐ No

☐ Unknown

☒ Not Applicable

—

4. Select the section(s) of the Fisheries Act and/or the Species at Risk Act where non-compliance applies.

☐ FA21

☐ FA20

☐ FA35

☐ FA38

☐ Not Applicable

☐ SARA32

☐ SARA33

☐ SARA58

—

5. If there is a compliance issue with the Fisheries Act or the Species at Risk Act, will there be further compliance action recommended?

☐ Yes

☐ No

☐ Unknown

☒ Not Applicable

—



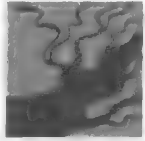
Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details.

Habitat Management

000197



PATH

Compliance Monitoring Form

Authorization

Report Date:

Page 6 of 7
2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

6. Is a follow up site visit required?

☐ Yes

☒ No

—

7. Is compliance monitoring now complete on this action?

☐ Yes

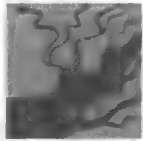
☒ No

—

Section D

Description:

Action Log:



PATH

Compliance Monitoring Form

Authorization

Report Date: Page 7 of 7
2019/08/30

Title:	Stewart World Port Groyne Installation, Bear River, Stewart, BC		
PATH No.:	16-HPAC-00732	Habitat File No.:	Receive Date: 2016/07/07

Request for FA Authorization, Section 6 Factors, Approval Letter, Signed Authorization, Notes from Rebecca Reid

-----Original Message-----

From: Gebrehiwot, Awet
Sent: August-02-16 4:15 PM
To: Rotinsky, Brenda
Cc: Nutton, Byron; Seefried, Len
Subject: RE: 16-HPAC-00732 Stewart World Port Emergency Authorization

Hi Len and Byron,

Attached please find the signed Authorization.

I have also attached a couple of comments from RDG. Thank you, Awet

-----Original Message-----

From: Rotinsky, Brenda
Sent: July-29-16 4:19 PM
To: Gebrehiwot, Awet
Cc: Nutton, Byron; Seefried, Len
Subject: 16-HPAC-00732 Stewart World Port Emergency Authorization

Hi Awet,

As discussed, you have the complete package for processing the Emergency Authorization for the above noted project on Tuesday morning. It has finished the BIO5 sign-off so is good to go right to the RDs office. When the Authorization is signed off, please send it to Byron and Len and cc me.

Thank you!
Brenda



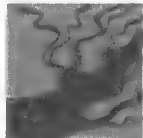
Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details.

Habitat Management

000199



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 1 of 7

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
 PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

Section A - PATH Main Information Screen

Category:			
Prop. Start:	2016/07/11	Prop. Completion:	2016/07/31
Assessor:	Mercer, Vance Fisheries Protection Program Biologist 200 - 401 Burrard Street Vancouver BC V6C 3S4 (604) 666-0280	Proponent:	Pettit, Brad Stewart World Port Services Ltd. 11421 Alaska Rd Fort St. John BC V1J 6N2
		Other Contact:	
Local Water:	Portland Canal at the mouth of the Bear River	Nearest Community:	Stewart
County / Municip.:	District of Stewart	Province / Territory:	British Columbia
Geo. Obj. Type:	Point	Latitude/Longitude:	55°55'04" 129°59'35"
Location Detail:	From Terrace, BC drive east to Kitwanga, drive north on highway 37 to Meziadin Junction, turn west on Highway 37a, drive to Stewart town site, and drive to the end of Railway St. to reach D17318 (Cassiar District).	Legal Description:	
UTM Zone:	9	Decimal Latitude:	55.92
UTM Easting:	437927	Decimal Longitude:	-129.99
UTM Northing:	6197365		

<u>Act/Reg.</u>	<u>Para./Sec.</u>	<u>Act or Regulation</u>	<u>Paragraphs or Sections</u>
-----------------	-------------------	--------------------------	-------------------------------

Section B - PATH Action Log Record

Action ID No.:	28	Action Date:	2016/08/02
Action:	Authorized - Fisheries Act Authorization Issued		
From:	Ω Gebrehiwot, Awet {x}	Effective Date:	2016/08/02
To:	Rotinsky, Brenda	Expiry Date:	2016/08/15
		Compensation:	<input checked="" type="checkbox"/>
Auth. Rationale:	CEAA EA is not required - NOT on Federal Lands		



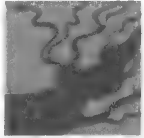
Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management

000200



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 2 of 7

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

Section C - Complete at site visit and enter on Site Visit screen in PATH

Date of Site Visit:

Visited by:

Who else was on site? (ie. Proponent representative, etc.)

Were photos taken or provided? (Note: Digital photos can be saved on the PATH Picture screen)

☐ Yes

☐ No

Was other data collected?

☐ Yes

☐ No

Is a Follow up Site Visit Required?

☐ Yes - Date for planned Follow up visit:

☐ No

General Observations - Enter a brief description (ie. weather, time of day, etc.)

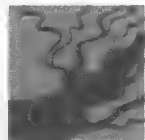


Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

Section C (Continued) - Enter on Compliance Monitoring screen in PATH

Work Status:

☐ Not Started

☐ In Progress

☒ Completed:

☐ Unknown

Section C - Authorization Issued

1. Were the proposed works/undertakings/activities completed as described in the authorization?

☐ Yes

☐ No

☐ Partial

☒ Unknown

This report addresses the offset measures as-built report. WUAs are not considered in this report.

2. Was the serious harm to fish as described in the authorization?

☐ Yes

☐ No

☐ Partial

☒ Unknown

This report addresses the offset measures as-built report.

3. If Species at Risk Act(SARA) conditions are included in the authorization, were the impacts on aquatic SARA species as described?

☐ Yes

☐ No

☐ Partial

☐ Unknown

☒ Not Applicable

4. Were the measures and standards to avoid and mitigate implemented as described in the authorization?

☒ Yes

☐ No

☐ Partial

☐ Unknown

5. Were the measures and standards to avoid and mitigate effective in preventing serious harm to fish or impacts to aquatic SARA species?

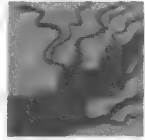
☒ Yes

☐ No

☐ Partial

☐ Unknown

☐ Not Applicable



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.: Receive Date: 2016/07/07

6. If included in the authorization, were the contingency measures implemented?

☐ Yes ☐ No ☐ Partial ☒ Unknown ☐ Not Applicable

Contingency measures associated with mitigating/avoiding serious harm not described in this report. No statement as to whether they were employed.

7. Were the contingency measures effective in preventing serious harm to fish or impacts to aquatic SARA species?

☐ Yes ☐ No ☐ Unknown ☒ Not Applicable

-

8. Were the offsetting measures implemented as described?

☐ Yes ☐ No ☒ Partial ☐ Unknown ☐ Not Applicable

Parcel A Offset measures deficient by 123m2. Proponent proposes to use 123m2 of habitat complexing features in adjacent Parcel B to address this deficiency.

9. Were the offsetting measures effective?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

As-built report. Not an effectiveness monitoring report.

10. How was the effectiveness of the measures assessed?

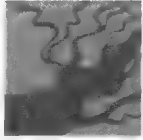
☐ Observational ☐ Functional ☐ Direct ☐ Other ☒ Not Applicable

effectiveness not assessed.

Section C (Continued)

1. Is there a compliance issue with the Fisheries Act?

☒ Yes ☐ No ☐ Unknown



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

Offsets deficient in area by 123m2.

2. Is there a compliance issue with the Species at Risk Act?

☐ Yes

☒ No

☐ Unknown

—

3. Did the proponent notify DFO?

☒ Yes

☐ No

☐ Unknown

☐ Not Applicable

Proponent notified DFO in this as-built report that the offsets were deficient.

4. Select the section(s) of the Fisheries Act and/or the Species at Risk Act where non-compliance applies.

☐ FA21

☐ FA20

☒ FA35

☐ FA38

☐ Not Applicable

☐ SARA32

☐ SARA33

☐ SARA58

—

5. If there is a compliance issue with the Fisheries Act or the Species at Risk Act, will there be further compliance action recommended?

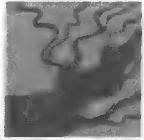
☐ Yes

☒ No

☐ Unknown

☐ Not Applicable

Proponent is addressing the non-compliance.



PATH

Compliance Monitoring Form

Authorization

Report Date:

Page 6 of 7
2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

6. Is a follow up site visit required?

☐ Yes

☒ No

—

7. Is compliance monitoring now complete on this action?

☐ Yes

☒ No

—

Section D

Description:

Action Log:



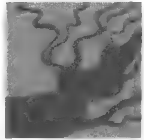
Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management

000205



PATH

Compliance Monitoring Form

Authorization

Report Date: Page 7 of 7
2019/08/30

Title:	Stewart World Port Groyne Installation, Bear River, Stewart, BC		
PATH No.:	16-HPAC-00732	Habitat File No.:	Receive Date: 2016/07/07

Request for FA Authorization, Section 6 Factors, Approval Letter, Signed Authorization, Notes from Rebecca Reid

-----Original Message-----

From: Gebrehiwot, Awet
Sent: August-02-16 4:15 PM
To: Rotinsky, Brenda
Cc: Nutton, Byron; Seefried, Len
Subject: RE: 16-HPAC-00732 Stewart World Port Emergency Authorization

Hi Len and Byron,

Attached please find the signed Authorization.

I have also attached a couple of comments from RDG. Thank you, Awet

-----Original Message-----

From: Rotinsky, Brenda
Sent: July-29-16 4:19 PM
To: Gebrehiwot, Awet
Cc: Nutton, Byron; Seefried, Len
Subject: 16-HPAC-00732 Stewart World Port Emergency Authorization

Hi Awet,

As discussed, you have the complete package for processing the Emergency Authorization for the above noted project on Tuesday morning. It has finished the BIO5 sign-off so is good to go right to the RDs office. When the Authorization is signed off, please send it to Byron and Len and cc me.

Thank you!
Brenda



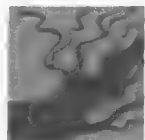
Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management

000206



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 1 of 7

Title:	Stewart World Port Groyne Installation, Bear River, Stewart, BC		
PATH No.:	16-HPAC-00732	Habitat File No.:	Receive Date: 2016/07/07

Section A - PATH Main Information Screen

Category:			
Prop. Start:	2016/07/11	Prop. Completion:	2016/07/31
Assessor:	Mercer, Vance Fisheries Protection Program Biologist 200 - 401 Burrard Street Vancouver BC V6C 3S4 (604) 666-0280	Proponent:	Pettit, Brad Stewart World Port Services Ltd. 11421 Alaska Rd Fort St. John BC V1J 6N2
		Other Contact:	
Local Water:	Portland Canal at the mouth of the Bear River	Nearest Community:	Stewart
County / Municip.:	District of Stewart	Province / Territory:	British Columbia
Geo. Obj. Type:	Point	Latitude/Longitude:	55°55'04" 129°59'35"
Location Detail:	From Terrace, BC drive east to Kitwanga, drive north on highway 37 to Meziadin Junction, turn west on Highway 37a, drive to Stewart town site, and drive to the end of Railway St. to reach D17318 (Cassiar District).	Legal Description:	
UTM Zone:	9	Decimal Latitude:	55.92
UTM Easting:	437927	Decimal Longitude:	-129.99
UTM Northing:	6197365		
<u>Act/Reg.</u>	<u>Para./Sec.</u>	<u>Act or Regulation</u>	<u>Paragraphs or Sections</u>

Section B - PATH Action Log Record

Action ID No.:	28	Action Date:	2016/08/02
Action:	Authorized - Fisheries Act Authorization Issued		
From:	Ω Gebrehiwot, Awet {x}	Effective Date:	2016/08/02
To:	Rotinsky, Brenda	Expiry Date:	2016/08/15
		Compensation:	<input checked="" type="checkbox"/>
Auth. Rationale:	CEAA EA is not required - NOT on Federal Lands		



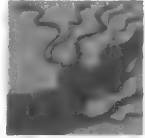
Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management

000207



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

Section C - Complete at site visit and enter on Site Visit screen in PATH

Date of Site Visit:

Visited by:

Who else was on site? (ie. Proponent representative, etc.)

Were photos taken or provided? (Note: Digital photos can be saved on the PATH Picture screen)

☐ Yes

☐ No

Was other data collected?

☐ Yes

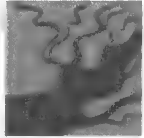
☐ No

Is a Follow up Site Visit Required?

☐ Yes - Date for planned Follow up visit:

☐ No

General Observations - Enter a brief description (ie. weather, time of day, etc.)



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

Section C (Continued) - Enter on Compliance Monitoring screen in PATH

Work Status:

☐ Not Started ☒ In Progress ☐ Completed: ☐ Unknown

Section C - Authorization Issued

1. Were the proposed works/undertakings/activities completed as described in the authorization?

☐ Yes ☐ No ☐ Partial ☒ Unknown

This submission is an addendum to the Offsetting As-built Report, dated October 25, 2017 and titled "Post Construction & As-Built Report 'Parcel A' for Stewart World Port". This offsetting is for two Authorizations (12-HPAC-PA4-00248 and 16-HPAC-00732).

2. Was the serious harm to fish as described in the authorization?

☐ Yes ☐ No ☐ Partial ☒ Unknown

This submission is an addendum to the Offsetting As-built Report, dated October 25, 2017 and titled "Post Construction & As-Built Report 'Parcel A' for Stewart World Port". This offsetting is for two Authorizations (12-HPAC-PA4-00248 and 16-HPAC-00732).

3. If Species at Risk Act(SARA) conditions are included in the authorization, were the impacts on aquatic SARA species as described?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

4. Were the measures and standards to avoid and mitigate implemented as described in the authorization?

☐ Yes ☐ No ☐ Partial ☒ Unknown

This submission is an addendum to the Offsetting As-built Report, dated October 25, 2017 and titled "Post Construction & As-Built Report 'Parcel A' for Stewart World Port". This offsetting is for two Authorizations (12-HPAC-PA4-00248 and 16-HPAC-00732).

5. Were the measures and standards to avoid and mitigate effective in preventing serious harm to fish or impacts to aquatic SARA species?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

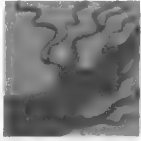


Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.: . Receive Date: 2016/07/07

6. If included in the authorization, were the contingency measures implemented?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

—

7. Were the contingency measures effective in preventing serious harm to fish or impacts to aquatic SARA species?

☐ Yes ☐ No ☐ Unknown ☒ Not Applicable

—

8. Were the offsetting measures implemented as described?

☐ Yes ☐ No ☒ Partial ☐ Unknown ☐ Not Applicable

This addendum to the As-Built Offsetting Report was in response to an email (December 7, 2017) sent to the proponent regarding the deficiency of 123 m² in offset area. This addendum satisfies the outstanding offsetting. However, they are still missing a habitat balance table that compares the serious harm/HADD to the final offset measures.

9. Were the offsetting measures effective?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

As-Built

10. How was the effectiveness of the measures assessed?

☐ Observational ☐ Functional ☐ Direct ☐ Other ☒ Not Applicable

As-Built

Section C (Continued)

1. Is there a compliance issue with the Fisheries Act?

☐ Yes ☒ No ☐ Unknown



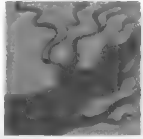
Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details.

Habitat Management

000210



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

—

2. Is there a compliance issue with the Species at Risk Act?

☐ Yes ☒ No ☐ Unknown

—

3. Did the proponent notify DFO?

☐ Yes ☐ No ☐ Unknown ☒ Not Applicable

—

4. Select the section(s) of the Fisheries Act and/or the Species at Risk Act where non-compliance applies.

☐ FA21 ☐ FA20 ☐ FA35 ☐ FA38 ☐ Not Applicable
☐ SARA32 ☐ SARA33 ☐ SARA58

—

5. If there is a compliance issue with the Fisheries Act or the Species at Risk Act, will there be further compliance action recommended?

☐ Yes ☐ No ☐ Unknown ☒ Not Applicable

—

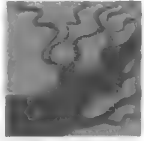


Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 6 of 7

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

6. Is a follow up site visit required?

☐ Yes

☒ No

—

7. Is compliance monitoring now complete on this action?

☐ Yes

☒ No

—

Section D

Description:

Action Log:

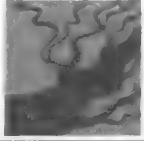


Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management



PATH

Compliance Monitoring Form

Authorization

Report Date: Page 7 of 7
2019/08/30

Title:	Stewart World Port Groyne Installation, Bear River, Stewart, BC		
PATH No.:	16-HPAC-00732	Habitat File No.:	Receive Date: 2016/07/07

Request for FA Authorization, Section 6 Factors, Approval Letter, Signed Authorization, Notes from Rebecca Reid

-----Original Message-----

From: Gebrehiwot, Awet
Sent: August-02-16 4:15 PM
To: Rotinsky, Brenda
Cc: Nutton, Byron; Seefried, Len
Subject: RE: 16-HPAC-00732 Stewart World Port Emergency Authorization

Hi Len and Byron,

Attached please find the signed Authorization.

I have also attached a couple of comments from RDG. Thank you, Awet

-----Original Message-----

From: Rotinsky, Brenda
Sent: July-29-16 4:19 PM
To: Gebrehiwot, Awet
Cc: Nutton, Byron; Seefried, Len
Subject: 16-HPAC-00732 Stewart World Port Emergency Authorization

Hi Awet,

As discussed, you have the complete package for processing the Emergency Authorization for the above noted project on Tuesday morning. It has finished the BIO5 sign-off so is good to go right to the RDs office. When the Authorization is signed off, please send it to Byron and Len and cc me.

Thank you!
Brenda



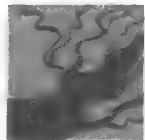
Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management

000213



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 1 of 7

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
 PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

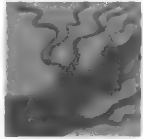
Section A - PATH Main Information Screen

Category:			
Prop. Start:	2016/07/11	Prop. Completion:	2016/07/31
Assessor:	Mercer, Vance Fisheries Protection Program Biologist 200 - 401 Burrard Street Vancouver BC V6C 3S4 (604) 666-0280	Proponent:	Pettit, Brad Stewart World Port Services Ltd. 11421 Alaska Rd Fort St. John BC V1J 6N2
		Other Contact:	
Local Water:	Portland Canal at the mouth of the Bear River	Nearest Community:	Stewart
County / Municipality:	District of Stewart	Province / Territory:	British Columbia
Geo. Obj. Type:	Point	Latitude/Longitude:	55°55'04" 129°59'35"
Location Detail:	From Terrace, BC drive east to Kitwanga, drive north on highway 37 to Meziadin Junction, turn west on Highway 37a, drive to Stewart town site, and drive to the end of Railway St. to reach D17318 (Cassiar District).	Legal Description:	
UTM Zone:	9	Decimal Latitude:	55.92
UTM Easting:	437927	Decimal Longitude:	-129.99
UTM Northing:	6197365		

<u>Act/Reg.</u>	<u>Para./Sec.</u>	<u>Act or Regulation</u>	<u>Paragraphs or Sections</u>
-----------------	-------------------	--------------------------	-------------------------------

Section B - PATH Action Log Record

Action ID No.:	28	Action Date:	2016/08/02
Action:	Authorized - Fisheries Act Authorization Issued		
From:	Ω Gebrehiwot, Awet {x}	Effective Date:	2016/08/02
To:	Rotinsky, Brenda	Expiry Date:	2016/08/15
		Compensation:	<input checked="" type="checkbox"/>
Auth. Rationale:	CEAA EA is not required - NOT on Federal Lands		



PATH

Compliance Monitoring Form

Authorization

Report Date: Page 2 of 7
2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

Section C - Complete at site visit and enter on Site Visit screen in PATH

Date of Site Visit:

Visited by:

Who else was on site? (ie. Proponent representative, etc.)

Were photos taken or provided? (Note: Digital photos can be saved on the PATH Picture screen)

☐ Yes

☐ No

Was other data collected?

☐ Yes

☐ No

Is a Follow up Site Visit Required?

☐ Yes - Date for planned Follow up visit:

☐ No

General Observations - Enter a brief description (ie. weather, time of day, etc.)

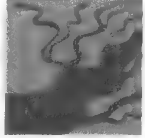


Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

Section C (Continued) - Enter on Compliance Monitoring screen in PATH

Work Status:

☐ Not Started ☒ In Progress ☐ Completed: ☐ Unknown

Section C - Authorization Issued

1. Were the proposed works/undertakings/activities completed as described in the authorization?

☒ Yes ☐ No ☐ Partial ☐ Unknown

The reiew consists of the Year1 effectiveness monitoring report for the Parcel A/B offset

2. Was the serious harm to fish as described in the authorization?

☐ Yes ☐ No ☐ Partial ☐ Unknown

The reiew consists of the Year1 effectiveness monitoring report for the Parcel A/B offset

3. If Species at Risk Act(SARA) conditions are included in the authorization, were the impacts on aquatic SARA species as described?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

4. Were the measures and standards to avoid and mitigate implemented as described in the authorization?

☒ Yes ☐ No ☐ Partial ☐ Unknown

The reiew consists of the Year1 effectiveness monitoring report for the Parcel A/B offset

5. Were the measures and standards to avoid and mitigate effective in preventing serious harm to fish or impacts to aquatic SARA species?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

The reiew consists of the Year1 effectiveness monitoring report for the Parcel A/B offset



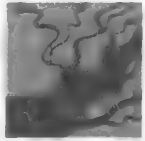
Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details.

Habitat Management

000216



PATH

Compliance Monitoring Form

Authorization

Report Date:

Page 4 of 7
2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

6. If included in the authorization, were the contingency measures implemented?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

The review consists of the Year1 effectiveness monitoring report for the Parcel A/B offset

7. Were the contingency measures effective in preventing serious harm to fish or impacts to aquatic SARA species?

☐ Yes ☐ No ☐ Unknown ☒ Not Applicable

The review consists of the Year1 effectiveness monitoring report for the Parcel A/B offset

8. Were the offsetting measures implemented as described?

☒ Yes ☐ No ☐ Partial ☐ Unknown ☐ Not Applicable

The constructed offsetting includes a reworked culvert to improve fish passage into a watercourse that surrounds the airport (airport creek), as well as pools and large woody debris structures. Together these features were intended to benefit local fish populations (e.g. coho salmon) and offset for outstanding adverse effects from projects 12-HPAC-PA4-00248 and 16-HPAC-00732.

9. Were the offsetting measures effective?

☒ Yes ☐ No ☐ Partial ☐ Unknown ☐ Not Applicable

Currently on a trend towards meeting the objectives of the authorization however, only at year 1 of 5. The offsetting habitat was found to be physically stable and functioning as intended with a large increase in utilization by young-of-year coho salmon.

10. How was the effectiveness of the measures assessed?

☐ Observational ☒ Functional ☐ Direct ☐ Other ☐ Not Applicable

Effectiveness monitoring was conducted on Parcel A and B between August 27 and 31, 2018. This included an assessment of culvert and off-channel habitat stability in Parcel A and B, water quality, fish presence and species diversity, and riparian community. The 2018 fish sampling was conducted using minnow traps at both the offsetting and reference locations.

Section C (Continued)

1. Is there a compliance issue with the Fisheries Act?

☐ Yes ☒ No ☐ Unknown



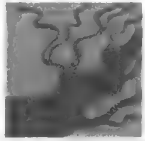
Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management

000217



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732

Habitat File No.:

Receive Date: 2016/07/07

—

2. Is there a compliance issue with the Species at Risk Act?

☐ Yes

☒ No

☐ Unknown

—

3. Did the proponent notify DFO?

☐ Yes

☐ No

☐ Unknown

☒ Not Applicable

—

4. Select the section(s) of the Fisheries Act and/or the Species at Risk Act where non-compliance applies.

☐ FA21

☐ FA20

☐ FA35

☐ FA38

☐ Not Applicable

☐ SARA32

☐ SARA33

☐ SARA58

—

5. If there is a compliance issue with the Fisheries Act or the Species at Risk Act, will there be further compliance action recommended?

☐ Yes

☐ No

☐ Unknown

☒ Not Applicable

—



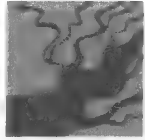
Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details.

Habitat Management

000218



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 6 of 7

Title: Stewart World Port Groyne Installation, Bear River, Stewart, BC
PATH No.: 16-HPAC-00732 Habitat File No.:

Receive Date: 2016/07/07

6. Is a follow up site visit required?

☐ Yes

☒ No

7. Is compliance monitoring now complete on this action?

☐ Yes

☒ No

This is Year 1 of 5 monitoring report. The second of three post-construction assessments of the offsetting habitat effectiveness should be performed in the summer of 2020 as originally scheduled.

Section D

Description:

Action Log:

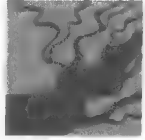


Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management



PATH

Compliance Monitoring Form

Authorization

Report Date: Page 7 of 7
2019 08.30

Title:	Stewart World Port Groyne Installation, Bear River, Stewart, BC		
PATH No.:	16-HPAC-00732	Habitat File No.:	Receive Date: 2016/07/07

Request for FA Authorization, Section 6 Factors, Approval Letter, Signed Authorization, Notes from Rebecca Reid

-----Original Message-----

From: Gebrehiwot, Awet
Sent: August-02-16 4:15 PM
To: Rotinsky, Brenda
Cc: Nutton, Byron; Seefried, Len
Subject: RE: 16-HPAC-00732 Stewart World Port Emergency Authorization

Hi Len and Byron,

Attached please find the signed Authorization.

I have also attached a couple of comments from RDG. Thank you, Awet

-----Original Message-----

From: Rotinsky, Brenda
Sent: July-29-16 4:19 PM
To: Gebrehiwot, Awet
Cc: Nutton, Byron; Seefried, Len
Subject: 16-HPAC-00732 Stewart World Port Emergency Authorization

Hi Awet,

As discussed, you have the complete package for processing the Emergency Authorization for the above noted project on Tuesday morning. It has finished the BIO5 sign-off so is good to go right to the RDs office. When the Authorization is signed off, please send it to Byron and Len and cc me.

Thank you!
Brenda



Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management

000220



Fisheries and Oceans Pêches et Océans
Canada Canada

PATH No.: 16-HPAC-00732

PARAGRAPH 35(2)(b) FISHERIES ACT AUTHORIZATION

Authorization issued to

Stewart World Port Services Ltd. (*hereafter referred to as the "Proponent"*)

Attention to: Brad Moffat, Chief Development Officer
11421 Alaska Road
Fort St. John, BC, V1J 6N2

Location of Proposed Project

Stewart World Port – end of Rail Street in Stewart, BC on southern end of DL7318 (Cassiar District)

Nearest community (city, town, village): Stewart
Municipality, district, township, county: Kitimat-Stikine Regional District
Province: British Columbia
Name of watercourse, waterbody: Bear River
Latitude and Longitude: 55.917 N, 129.993 W

Description of Proposed Project

The proposed project of which the work, undertaking or activity authorized is a part involves:

- Re-installation of the DL7318 (Cassiar District) tenured groyne at the mouth of the Bear River to address risk to worker safety and Stewart World Port wharf.

Description of Authorized work(s), undertaking(s) or activity(ies)

- Construction of a riprap groyne approximately 120 meters long and 11 meters wide (1,320 m²) in the Bear River.

The serious harm to fish likely to result from the proposed work(s), undertaking(s), or activity(ies), and covered by this authorization includes

- Destruction of no more than 1,320 m² of riverine fish habitat.
- Permanent alteration of estuarine habitat due to changes of flow and sediment deposition

Conditions of Authorization

The above described work, undertaking or activity must be carried on in accordance with the following conditions.

1. Conditions that relate to the period during which the work, undertaking or activity can be carried on

The work, undertaking or activity is authorized to be carried on during the following period:

From date of issuance to August 15, 2016

If the Proponent cannot complete the work, undertaking or activity during this period, Fisheries and Oceans Canada (DFO) must be notified in advance of the expiration of the above time period. DFO may, where appropriate, provide written notice that the period to carry on the work, undertaking or activity has been extended.

The periods during which other conditions of this authorization must be complied with are provided in their respective sections below. DFO may, where appropriate, provide written notice that these periods have been extended, in order to correspond to the extension of the period to carry on a work, undertaking, or activity.

2. Conditions that relate to measures and standards

2.1 Prior to commencing construction activities, baseline elevations, bathymetry detail, and photo documentation at georeferenced locations shall be collected within the project area (i.e. Bear River and Bear River Estuary) to characterize site conditions within the vicinity of the project.

2.2 List of measures and standards:

2.2.1 Project Planning

- 2.2.1.1 Minimize duration of in-water work.
- 2.2.1.2 Conduct instream work during periods of low flow, or at low tide, to further reduce the risk to fish and their habitat, or to allow work in water to be isolated from flows.
- 2.2.1.3 Schedule work to avoid wet, windy and rainy periods that may increase erosion and sedimentation.
- 2.2.1.4 Design and plan activities and works in water such that loss or disturbance to aquatic habitat is minimized and sensitive spawning habitats are avoided.
- 2.2.1.5 Plan activities near water such that materials such as paint, primers, blasting abrasives, rust solvents, degreasers, grout, poured concrete or other deleterious substances do not enter the watercourse.
- 2.2.1.6 Develop a response plan that is to be implemented immediately in the event of a sediment release or spill of a deleterious substance and keep an emergency spill kit on site.
- 2.2.1.7 Ensure that building material used in the watercourse has been handled and treated in a manner to prevent the release or leaching of substances into the water that may be deleterious to fish.

- 2.2.2 Erosion and Sediment Control: Develop and implement an Erosion and Sediment Control Plan for the site that minimizes risk of sedimentation of the waterbody during all phases of the project. Erosion and sediment control measures should be maintained until all disturbed ground has been permanently stabilized, suspended sediment has resettled to the bed of the waterbody or settling basin and runoff water is clear. The plan should, where applicable, include:
- Installation of effective erosion and sediment control measures before starting work to prevent sediment from entering the water body;
 - Regular inspection and maintenance of erosion and sediment control measures and structures during the course of construction;
 - Repairs to erosion and sediment control measures and structures if damage occurs; and
 - Removal of non-biodegradable erosion and sediment control materials once site is stabilized.
- 2.2.3 Fish Protection:
- Ensure that all in-water activities, or associated in-water structures, do not interfere with fish passage, constrict the channel width, or reduce flows.
 - A 200m safety zone will be established and if any marine mammal is sighted within the zone, in-water work will be stopped until all marine mammals have been observed to have left the safety zone or has not been re-sighted for 30 minutes.
- 2.2.4 Operation of Machinery:
- 2.2.4.1 Ensure that machinery arrives on site in a clean condition and is maintained free of fluid leaks, invasive species and noxious weeds.
- 2.2.4.2 Wash, refuel and service machinery and store fuel and other materials for the machinery in such a way as to prevent any deleterious substances from entering the water.
- 2.3 Contingency measures shall be put in place if monitoring required in condition 3 below indicates that the measures and standards are not successful.
- 2.4 Dates by which these measures and standards shall be implemented: Measures and standards shall be implemented prior to the proposed works, during the proposed works and following completion of the proposed works, as appropriate.
- 3. Conditions that relate to monitoring and reporting of measures and standards**
- 3.1 The Proponent will monitor all in-water works and report any observed fish kill to DFO immediately, in accordance sub-section 38(4) of the *Fisheries Act*.
- 3.2 The Proponent shall monitor the implementation of avoidance and mitigation measures referred to in section 2 of this authorization and provide DFO daily environmental monitoring reports during the period of in-water works (including standardized turbidity monitoring). This shall be done by:
- 3.2.1 Providing dated photographs and inspection reports to demonstrate effective implementation and functioning of mitigation measures and standards described above.
- 3.2.2 Providing details of any contingency measures that were followed, to prevent impacts greater than those covered by this authorization in the event that mitigation measures did not function as described.
- 3.3 The Proponent will submit a summary environmental monitoring report to DFO within 15 days of the completion of works, and indicate whether the measures and standards were conducted according to the conditions of this authorization.
- 3.4 Within 30 days of the completion of works the proponent shall submit a post-construction as-built report with surveyed drawings and photographs of the emergency works (i.e. groyne), including post-works elevations/bathymetry of the project area (i.e. Bear River and Bear River Estuary) with a comparison to pre-construction conditions as documented in accordance with condition 2.1.

- 3.5 Within 30 days of the issuance of this *Fisheries Act* Authorization the proponent shall submit a fluvial geomorphic monitoring plan for acceptance by DFO, unless DFO agrees to extend this date. The plan will address the potential aggradation/degradation of the bed and planform changes of the channel to sub-decimeter accuracy in the lower Bear River and the Bear River Estuary. At a minimum the plan should include the following:
- 3.5.1 A sampling/survey interval that provides adequate temporal resolution to reasonably detect channel and estuary changes;
 - 3.5.2 A geographical extent that encompasses the Lower Tidal Depositional Zone and Upper Tidal Depositional Zone as referenced by Northwest Hydraulic Consultants Ltd. (NHC) (approximately River station 0+000 m to 1+870 m), in addition to the Bear River Estuary; and
 - 3.5.3 A reporting schedule.

4. Conditions that relate to offsetting

- 4.1 The Proponent shall prepare a draft offsetting plan, consistent with the DFO *Fisheries Protection Policy Statement* (October 2013) and *Fisheries Productivity Investment Policy: A Proponent's Guide to Offsetting* (November 2013), and submit the draft offsetting plan to DFO for review within 90 days of the issuance of the *Fisheries Act* Authorization, unless DFO agrees to extend this date.
- 4.2 The offsetting plan shall include the information identified in Schedule 1 Section 13 of the *Applications for Authorization under Paragraph 35(2) of the Fisheries Act Regulations*.
- 4.3 A final offsetting plan acceptable to DFO must be prepared by the Proponent within 180 days of the issuance of the *Fisheries Act* Authorization, unless DFO agrees to extend this date. This final offsetting plan must include an itemized estimate of the value of the letter of credit referenced in condition 4.4.
- 4.4 The proponent must submit a letter of credit within 14 days of DFO's acceptance of the final offsetting plan to the DFO c/o Fisheries Protection Program Regulatory Reviews Manager, at Suite 200 – 401 Burrard Street, Vancouver, BC V6C 3S4. The letter of credit must be issued by a recognized Canadian financial institution in an amount sufficient to complete the offsetting plan and monitoring program. For guidance on how to prepare a letter of credit refer to the DFO document *An Applicant's Guide to Submitting an Application for Authorization under Paragraph 35(2)(b) of the Fisheries Act*.
- 4.5 DFO may draw upon funds available to DFO as the beneficiary of the letter of credit provided to DFO as per condition 4.4, to cover the costs of implementing the offsetting measures required under this authorization, including the associated monitoring and reporting measures included in section 5. This would occur in instances where the Proponent fails to implement these required measures.
- 4.6 If the results of monitoring as required in condition 5 indicate that the offsetting measures are not completed by the date specified and/or are not functioning as intended (i.e. as described in the final offsetting plan that has been accepted by DFO), the Proponent shall give written notice to DFO and shall implement the contingency measures and associated monitoring measures, as contained within the final offsetting plan, to ensure the implementation of the offsetting measures is completed and/or functioning as required by this authorization.
- 4.7 The Proponent shall not carry on any work, undertaking or activity that will adversely disturb or impact the offsetting measures.

5. Conditions that relate to monitoring and reporting of implementation of offsetting measures (described above in section 4):

- 5.1 The Proponent shall conduct monitoring of the offsetting measures according to the schedule and criteria in the final offsetting plan accepted by DFO.
- 5.2 The Proponent shall report to DFO that the offsetting works were conducted according to the conditions of this Authorization by providing monitoring reports in accordance with the schedule and criteria in the final offsetting plan accepted by DFO.

PATH No.: 16-HPAC-00732

Authorization Limitations and Application Conditions

The Proponent is solely responsible for plans and specifications relating to this authorization and for all design, safety and workmanship aspects of all the works associated with this authorization.

The holder of this authorization is hereby authorized under the authority of Paragraph 35(2)(b) of the *Fisheries Act*, R.S.C., 1985, c.F. 14 to carry on the work(s), undertaking(s) and/or activity(ies) that are likely to result in serious harm to fish as described herein. This authorization does not purport to release the applicant from any obligation to obtain permission from or to comply with the requirements of any other regulatory agencies.

This authorization does not permit the deposit of a deleterious substance in water frequented by fish. Subsection 36(3) of the *Fisheries Act* prohibits the deposit of any deleterious substances into waters frequented by fish unless authorized by regulations made by Governor in Council.

This authorization does not permit the killing, harming, harassment, capture or taking of individuals of any aquatic species listed under the *Species at Risk Act* (SARA) (s. 32 of the SARA), or the damage or destruction of residence of individuals of such species (s. 33 of the SARA) or the destruction of the critical habitat of any such species (s. 58 of the SARA).

At the date of issuance of this authorization, no individuals of aquatic species listed under the *Species at Risk Act* were identified in the vicinity of the authorized works, undertakings or activities.

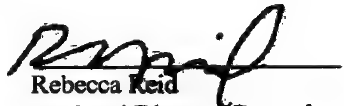
The failure to comply with any condition of this authorization constitutes an offence under Paragraph 40(3)(a) of the *Fisheries Act* and may result in charges being laid under the *Fisheries Act*.

This authorization must be held on site and work crews must be made familiar with the conditions attached.

This authorization cannot be transferred or assigned to another party. If the work(s), undertaking(s) or activity(ies) authorized to be conducted pursuant to this authorization are expected to be sold or transferred, or other circumstances arise that are expected to result in a new Proponent taking over the work(s), undertaking(s) or activity(ies), the Proponent named in this authorization shall advise DFO in advance.

Date of Issuance: AUG 02 2016

Approved by:


Rebecca Reid
Regional Director General
Pacific Region
Fisheries and Oceans Canada

16-HPAC-00732

Jan 30/17

12-HPAC-PA4-00248

BBRT

-Twin 600mm CMP

-Proposed offsetting south of Stewart
Airport runway.

-Offset includes improving fish access
through the replacement of the existing
culverts.

-Bottom of culverts 0.79m to waterline
at 16:31

Tide for the day (station #9475)

06:11 6.5m

08:57 1.8m

14:59 6.8m @ 16:00 (6.4m) @ 17:00 (5.5m)

21:24 0.9m

-Snow prevented PPA observation of
ULS fish habitat as the riparian and
channeled blanket.

10.21

FPP COMPLIANCE MONITORING SITE VISIT FORM - AUTHORIZATION AND LOAs

Fisheries and Oceans
CanadaPêches et Océans
Canada

PROJECT/SITE INFORMATION (Complete this section prior to site visit with information from Project File, where possible)	Referral title: <u>Groyne Installation (Emergency works)</u>		Site visit date: <u>2017 / 01 / 30</u> ⁸⁶ Year Month Day			
	FPP assessor: <u>Len Seefried</u>	Monitor name(s): <u>Bruce Barber, Renny Talbot</u>	Client contact info (name and phone no.): <u>Brad Moffat</u> <u>250-819-4341</u>			
	Waterbody name: <u>Bear River Estuary</u>	Location (address/directions/GPS coordinates): <u>Stewart, BC</u>	Work Status <input type="checkbox"/> Not Started <input type="checkbox"/> In-progress <input checked="" type="checkbox"/> Completed <input type="checkbox"/> Unknown <input type="checkbox"/> Discontinued			
	Others on site? (Proponent, Consultant, Fishery Officer, etc.): <u>None</u>					
COMPLIANCE MONITORING Authorization Only	Pre-project site description:					
	Habitat type(s): FRESHWATER: <input type="checkbox"/> In-channel <input type="checkbox"/> Off-channel <input type="checkbox"/> Lacustrine <input type="checkbox"/> Wetland <input type="checkbox"/> Riparian MARINE: <input checked="" type="checkbox"/> Marine/estuarine Intertidal <input type="checkbox"/> Marine/estuarine Subtidal <input type="checkbox"/> Riparian/backshore					
	Habitat function(s): <input checked="" type="checkbox"/> Spawning <input checked="" type="checkbox"/> Migration <input checked="" type="checkbox"/> Rearing <input checked="" type="checkbox"/> Holding <input type="checkbox"/> Food and nutrient					
	Fish species present: <u>none observed.</u>					
Description of component works, undertaking or activities on-site (from LEADR and/or Project File): <u>A riprap groyne was constructed in August 2016. This groyne is an extension of an existing groyne.</u>						
Were photos taken? (Identify photographer and location where photos will be stored)		Yes	No	Partial	Unknown	N/A
		<input checked="" type="checkbox"/>	<input type="checkbox"/>			
1. Were the works, undertakings or activities completed as described in the Authorization/LOA/Project Proposal? If "No" or "Partial", describe: <u>Groyne footprint is smaller but overall it is as proposed.</u>		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Was the serious harm to fish as described in the Authorization? If "No" or "Partial", describe unauthorized residual harm to fish (e.g., death of fish, permanent alteration, or destruction of fish habitat): <u>Footprint is smaller. less destruction.</u>		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. If Species at Risk Act (SARA) conditions are included in the authorization, were the impacts on aquatic SARA species as described? If "No" or "Partial", describe unauthorized impacts (e.g. death of SAR individuals, destruction of critical habitat).		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. Were the measures and standards to avoid and mitigate serious harm to fish or impacts to aquatic SARA species implemented as described? If "No" or "Partial", describe: <u>Construction complete. Monitoring not able to assess mitigation measures during construction.</u>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

FPP COMPLIANCE MONITORING SITE VISIT FORM - AUTHORIZATION AND LOAs

Fisheries and Oceans
CanadaPêches et Océans
Canada

		Yes	No	Partial	Unknown	N/A
COMPLIANCE MONITORING	5. Were these measures and standards to avoid and mitigate effective in preventing serious harm to fish or impacts to aquatic SARA species? If "No" or "Partial", describe:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	6. Were there contingency avoidance or mitigation measures required and/or implemented? If "Yes" or "Partial" describe:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	7. Were the contingency measures effective in preventing serious harm to fish or impacts to aquatic SARA species? If "No" or "Partial", describe:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	8. Were the offsetting measures implemented as described? If "No" or "Partial", describe: <i>Not constructed yet. Proposed between Feb 1st March 31/17.</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	9. Were the offsetting measures effective at preventing serious harm to fish or impacts to SARA species? If "No" or "Partial", describe:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
COMPLIANCE MONITORING	<p>10. How was the effectiveness of the measures (mitigation, contingency or offsetting) assessed?</p> <p><i>Observational:</i> Effectiveness is determined by a combination of visual observations, expert opinion and general knowledge of the file. Information source: visual assessment during a site visit.</p> <p><i>Functional:</i> Effectiveness is determined by surrogate metrics of fish productivity including: area (e.g., project vs. offset); visual assessment of function and; some biotic measures (e.g., macrophyte density or amount of a substrate type). Monitoring program includes spatial and trend components. Information source: proponent's monitoring report(s).</p> <p><i>Direct:</i> Effectiveness is determined by direct metrics of fishery productivity including: physical and key biotic indicators (e.g., primary producers, invertebrates, fish). Monitoring program includes spatial and trend components for statistical assessment of effect (e.g., Before-After Control-Impact design). Information source: proponent's monitoring report(s).</p> <p>Observational <input type="checkbox"/> Functional <input type="checkbox"/> Direct <input type="checkbox"/> Other <input type="checkbox"/> N/A <input checked="" type="checkbox"/></p> <p>Describe if "Other" or "N/A" is selected or include other relevant comments: <i>Construction complete and offset not constructed. Monitors were looking at footprint of groyne.</i></p>					
		Yes	No	Partial	Unknown	N/A
	11. Is there a compliance issue with the <i>Fisheries Act</i> ? If "Yes", describe:	<input type="checkbox"/>	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
	13. Is there a compliance issue with the <i>Species at Risk Act</i> ? If "Yes", describe:	<input type="checkbox"/>	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
	14. If a compliance issue was identified, did the proponent notify DFO?	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

FPP COMPLIANCE MONITORING SITE VISIT FORM - AUTHORIZATION AND LOAs



Fisheries and Oceans
Canada

Pêches et Océans
Canada

	Yes	No	Partial	Unknown	N/A
<p>15. If there is a compliance issue with the <i>Fisheries Act</i> or the <i>Species at Risk Act</i>, identify the section(s) where non-compliance applies: Fisheries Act: 20 21 35 38 SARA: 32 33 58 Describe the non-compliance issue:</p>	<input type="checkbox"/>	<input type="checkbox"/>			<input checked="" type="checkbox"/>
<p>16. If there is a compliance issue with the <i>Fisheries Act</i> or the <i>Species at Risk Act</i>, will there be further compliance action recommended? Please discuss a "Yes" response with your supervisor and describe rationale:</p>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>17. Is a follow-up site visit required? If "Yes", describe why:</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
<p>18. Is Compliance monitoring for this site now complete? If monitoring for the entire Project is complete, the PATH Project file should be closed. <i>offset not constructed.</i></p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>			

Summary of Findings and/or Follow-up Actions:

16-HPAC-00732

Jan 31/17

09:40 low tide
clear skies

B&RT

- Review footprint of grayne using
Garmin GPSmap 76CSx and TruePulse
range finder.

- Track of toe of grayne was taken
- High water considered where snow line

WP 80 high water line at boat lab-oh

WP 81 western elbow

WP 82 southern tip of grayne.

WP 83 eastern side of elbow

WP 84 Potential start of works?

WP 85 western side of potential start of works?

Pics/

1194 looking south from WP 80 at grayne

1195 looking north from WP 81

1196 looking south from WP 81

1197 looking north from WP 82 @ west side

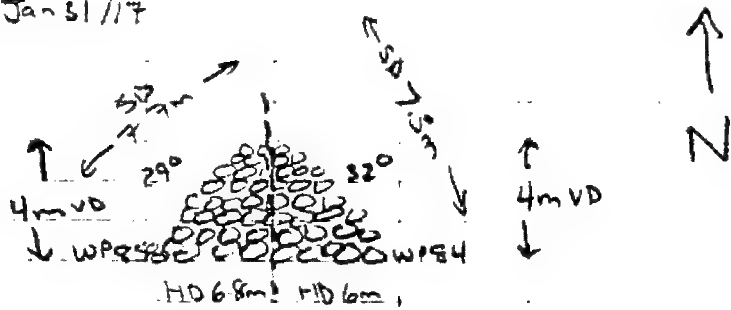
1198 looking north @ WP 82

1199 looking north @ east side of grayne
from WP 82

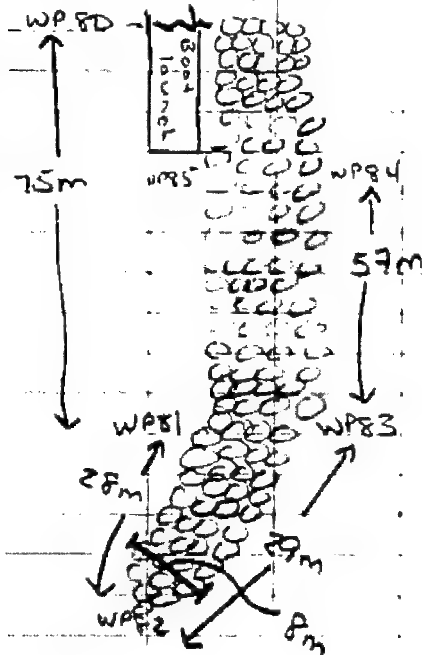
1200 looking north from WP 83

1 of 2

Jan 31 / 17



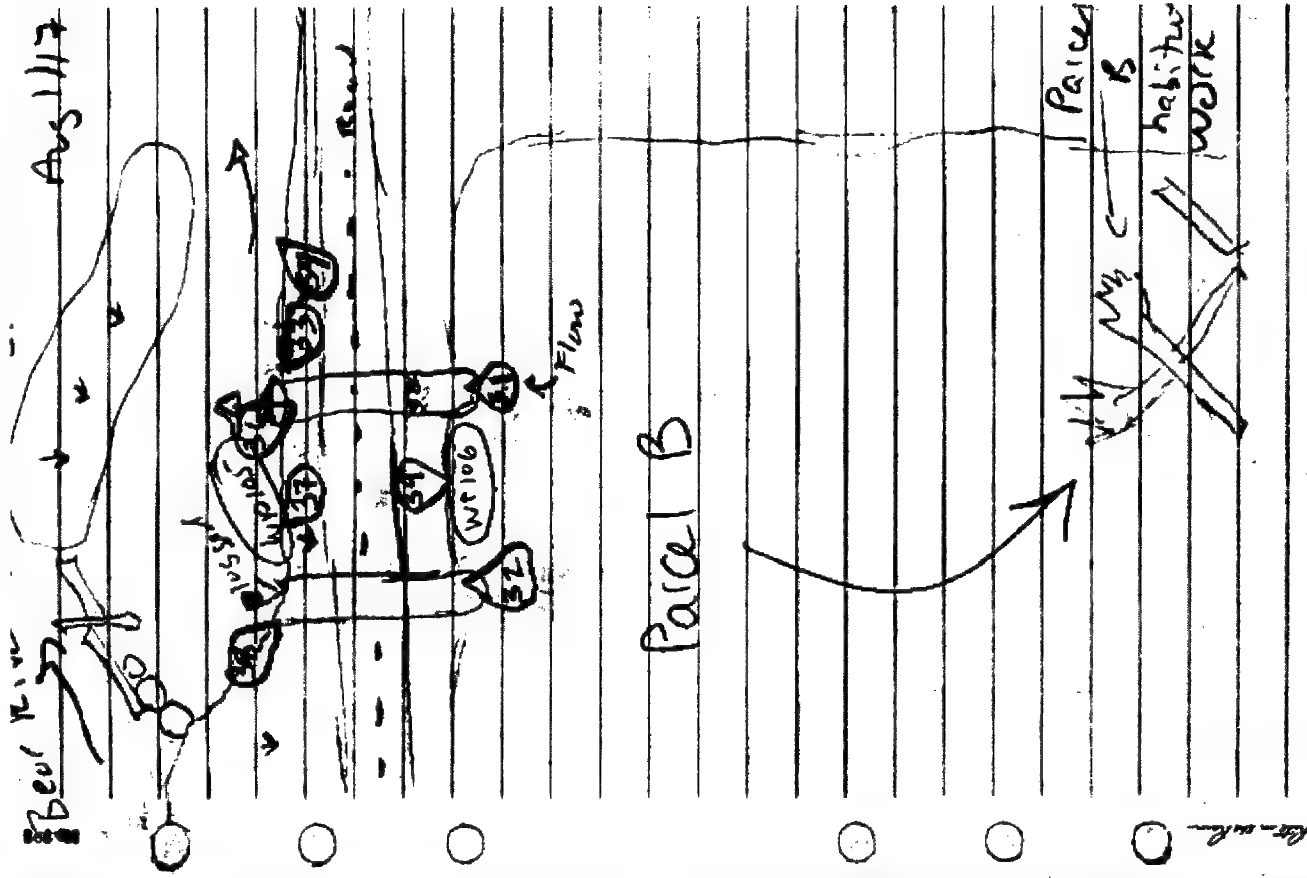
Cross section at location of potential start of works (WP84 + WP85). Eastern cross section has horizontal distance (HD) of 6m, slope distance (SD) of 7.3m, vertical distance (VD) of 4m, slope of 32°. Western cross section has HD 6.8m, SD 7.7m, VD 4m, slope of 29°.



16-HPAC-00732

2 of 2

Commercial Solutions Inc
www.commercialsolutions.ca



SWP

Aug 8 / 17

- WP 71c Comment
Eastern CVTS draining Airport Ck
106 31 Southern cut
32 looking through
33 northern CVT inlet
CVT outlets looking
Bear River
34 Look south from
CVT outlets. Bear River
Maastan in background
35 Delete
36 Southern CVT looking
from outlet
105 37 Northern CVT outlet
38 Plugged northern CVT
outlet
39 CVT inlets looking
west of Parcel B habitat
work
40 Right bank berm
looking W/S from
crest of northern extent
41 looking W/S from northern
extent of berm
42 left bank berm from
right bank berm
43 right bank berm from

SWP - Gravel extraction
17-HPAC-00218
Aug 17

NP	PIC	Comment	
109	44	river left bank look als 2 gravel bar area (wid)	<input type="radio"/>
109	45	same as pic 44	<input type="radio"/>
109	46	river left bank look als	<input type="radio"/>

- Note: PICS 31-39 culverts that drain Parcel B into Bear River
- PICS 40-43 Berms (rip rap) at Bear River Bridge (Hwy) crossing
 - PICS 44-46 Gravel extraction area
 - Need to confirm in SWP where they delineate top of bank for the Bear River riparian. Forested area likely inundated during high water. Where is their top of bank delineated?

DARLING CORP YACOMA WA
www.RiparianRain.com

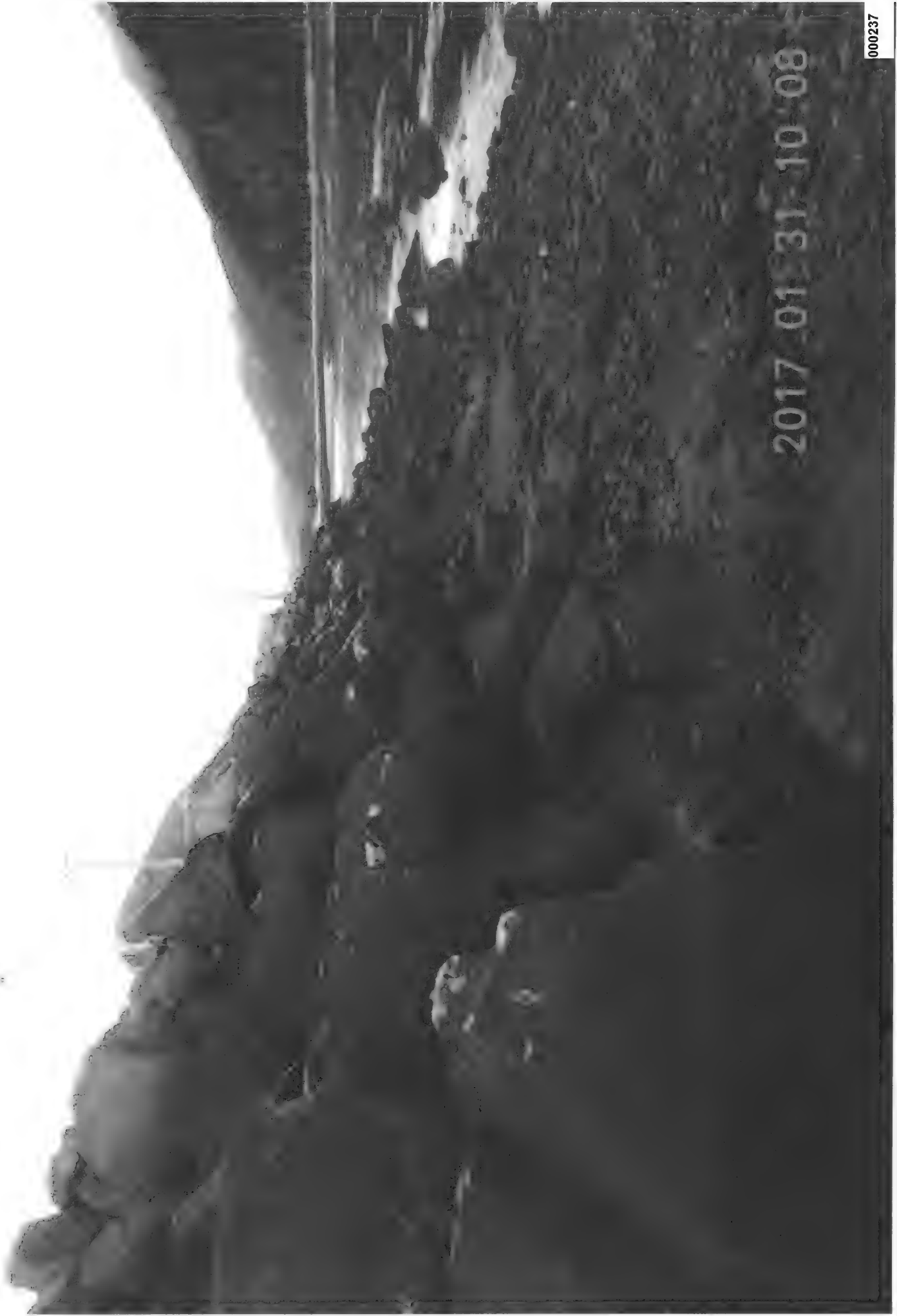
080

085 084

081 083

082







2017.01.31 10:31



2017.01.30 16:31



2000-01-27 00:00



2017.01.31 09:57

2017-01-31 09:55



2017-09-31 10:02



2017.01.31 10:03



Fisheries and Oceans Pêches et Océans
Canada Canada

3190 Hammond Bay Road
Nanaimo, BC V9T 6N7

FEB 16 2017

Your file Votre référence

Our file Notre référence
12-HPAC-PA4-00248
16-HPAC-00732

Brad Moffat, Chief Development Officer
Stewart World Port Services Ltd.
11421 Alaska Road
Fort St. John, BC, V1J 6N2

Delivered via email: bmoffat@stewartworldport.com

Dear Mr. Moffat:

**Subject: Notification of modifications to dates in conditions of Paragraph 35(2)(b)
Fisheries Act authorizations (12-HPAC-PA4-00248 and 16-HPAC-00732)**

The Fisheries Protection Program (the Program) of Fisheries and Oceans Canada hereby modifies the condition that relates to the period during which the offsetting measures must be completed.

Due to seasonal environmental factors (i.e. frozen ground and heavy snow load) the timing window for offsetting construction has been extended from February 15 to March 31, 2017.

The Program has determined that the modification of the offsetting construction date in the conditions of authorization will not increase the level of harm to fish and habitat described in both authorizations.

A copy of both authorizations and a copy of this letter must be kept on site while the work is in progress. Work crews must be familiar with and able to adhere to the conditions.

Failure to comply with the conditions of both authorizations may lead to prosecution under the *Fisheries Act*.

Canada

- 2 -

If you or anyone conducting work on your behalf have any questions, please contact Len Seefried at our Nanaimo office at (250) 618-8559, or by email at len.seefried@dfo-mpo.gc.ca.

Yours sincerely,

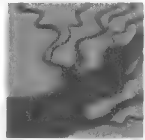


Alain (Al) Magnan, R.P.Bio.
A/Regulatory Manager
Fisheries Protection Program

Attached: Monitoring & Reporting Schedule

Monitoring & Reporting Schedule
16-HPAC-00732 and 12-HPAC-PA4-00248

Activity	Due Date
Letter of Credit	Within 14 Days of DFO Acceptance
Post-Construction As-Built Survey	May 15, 2017
Year 1 Habitat Effectiveness Report	September 30, 2018
Year 3 Habitat Effectiveness Report	September 30, 2020
Year 5 Habitat Effectiveness Report	September 30, 2022



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 1 of 6

Title: Avalanche Shield Rock Groyne/Berm Infill, Bear River Estuary, Stewart
PATH No.: 17-HPAC-00206 Habitat File No.: Receive Date: 2017/03/24

Section A - PATH Main Information Screen

Category:
Prop. Start: Prop. Completion:

Assessor: Mercer, Vance
Fisheries Protection Program Biologist
200 - 401 Burrard Street
Vancouver BC
V6C 3S4 (604) 666-0280

Proponent: Pettit, Brad
Stewart World Port Services Ltd.
11421 Alaska Rd
Fort St. John BC
V1J 6N2

Other Contact:

Local Water: Bear River Estuary
County / Municip.:
Geo. Obj. Type:
Location Detail:
UTM Zone:
UTM Easting:
UTM Northing:

Nearest Community: Stewart
Province / Territory: British Columbia
Latitude/Longitude:
Legal Description:
Decimal Latitude:
Decimal Longitude:

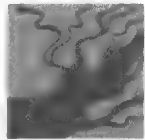
Act/Reg. Para./Sec. Act or Regulation Paragraphs or Sections

Section B - PATH Action Log Record

Action ID No.: 55 Action Date: 2018/04/13
Action: Authorized - Fisheries Act Authorization Issued

From: Effective Date: 2018/04/13
To: Expiry Date: 2019/04/01
Compensation: ☒

Auth. Rationale: CEAA EA is not required - NOT on Federal Lands



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 2 of 6

Title: Avalanche Shield Rock Groyne/Berm Infill, Bear River Estuary, Stewart
PATH No.: 17-HPAC-00206

Habitat File No.:

Receive Date: 2017/03/24

Section C - Complete at site visit and enter on Site Visit screen in PATH

Date of Site Visit: 2018/09/25 Visited by: Mercer, Vance

Who else was on site? (ie. Proponent representative, etc.)

Were photos taken or provided? (Note: Digital photos can be saved on the PATH Picture screen)

☐ Yes

☒ No

Was other data collected?

☐ Yes

☒ No

Is a Follow up Site Visit Required?

☐ Yes - Date for planned Follow up visit:

☒ No

General Observations - Enter a brief description (ie. weather, time of day, etc.)

Site visit (post construction) to confirm as-built groyne.

Range finder used to measure total length of approx. 333m

Start of groyne

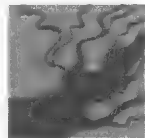
North side Slope Distance (SD) = 10.7 m

South side Slope Distance (SD) = 8.6 m

End of groyne

North side Slope Distance (SD) = 11.1 m

South side Slope Distance (SD) = 10.0 m



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Title: Avalanche Shield Rock Groyne/Berm Infill, Bear River Estuary, Stewart
PATH No.: 17-HPAC-00206

Habitat File No.:

Receive Date: 2017/03/24

Section C (Continued) - Enter on Compliance Monitoring screen in PATH

Work Status:

☐ Not Started ☒ In Progress ☐ Completed: ☐ Unknown

Section C - Authorization Issued

1. Were the proposed works/undertakings/activities completed as described in the authorization?

☒ Yes ☐ No ☐ Partial ☐ Unknown

The site visit was for a post construction inspection

2. Was the serious harm to fish as described in the authorization?

☒ Yes ☐ No ☐ Partial ☐ Unknown

The site visit was for a post construction inspection

3. If Species at Risk Act(SARA) conditions are included in the authorization, were the impacts on aquatic SARA species as described?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

The site visit was for a post construction inspection

4. Were the measures and standards to avoid and mitigate implemented as described in the authorization?

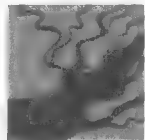
☒ Yes ☐ No ☐ Partial ☐ Unknown

this was evaluated in the monitoring report reviewed (Action ID #63)

5. Were the measures and standards to avoid and mitigate effective in preventing serious harm to fish or impacts to aquatic SARA species?

☒ Yes ☐ No ☐ Partial ☐ Unknown ☐ Not Applicable

this was evaluated in the monitoring report reviewed (Action ID #63)



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 4 of 6

Title: Avalanche Shield Rock Groyne/Berm Infill, Bear River Estuary, Stewart

PATH No.: 17-HPAC-00206

Habitat File No.:

Receive Date: 2017/03/24

6. If included in the authorization, were the contingency measures implemented?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

The site visit was for a post construction inspection

7. Were the contingency measures effective in preventing serious harm to fish or impacts to aquatic SARA species?

☐ Yes ☐ No ☐ Unknown ☒ Not Applicable

The site visit was for a post construction inspection

8. Were the offsetting measures implemented as described?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

This review was for a post-construction report for the authorized works (not the offsetting). The offsetting (under DFO approval) is scheduled to be begin in November 2018

9. Were the offsetting measures effective?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

This review was for a post-construction report for the authorized works (not the offsetting). The offsetting (under DFO approval) is scheduled to be begin in November 2018

10. How was the effectiveness of the measures assessed?

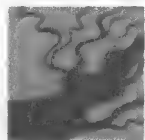
☐ Observational ☐ Functional ☐ Direct ☐ Other ☒ Not Applicable

The offsetting is scheduled to be begin in November 2018

Section C (Continued)

1. Is there a compliance issue with the Fisheries Act?

☐ Yes ☒ No ☐ Unknown



PATH

Compliance Monitoring Form

Authorization

Report Date:

Page 5 of 6
2019/08/30

Title: Avalanche Shield Rock Groyne/Berm Infill, Bear River Estuary, Stewart

PATH No.: 17-HPAC-00206

Habitat File No.:

Receive Date:

2017/03/24

—

2. Is there a compliance issue with the Species at Risk Act?

☐ Yes

☒ No

☐ Unknown

—

3. Did the proponent notify DFO?

☐ Yes

☐ No

☐ Unknown

☒ Not Applicable

—

4. Select the section(s) of the Fisheries Act and/or the Species at Risk Act where non-compliance applies.

☐ FA21

☐ FA20

☐ FA35

☐ FA38

☐ Not Applicable

☐ SARA32

☐ SARA33

☐ SARA58

—

5. If there is a compliance issue with the Fisheries Act or the Species at Risk Act, will there be further compliance action recommended?

☐ Yes

☐ No

☐ Unknown

☒ Not Applicable

—



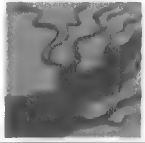
Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management

000251



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 6 of 6

Title: Avalanche Shield Rock Groyne/Berm Infill, Bear River Estuary, Stewart
PATH No.: 17-HPAC-00206

Habitat File No.:

Receive Date: 2017/03/24

6. Is a follow up site visit required?

☐ Yes

☒ No

7. Is compliance monitoring now complete on this action?

☐ Yes

☒ No

The offsetting is scheduled to be begin in November 2018 and an additional site visit could be completed following the construction.

Section D

Description:

Action Log:



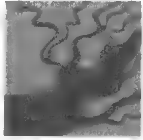
Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management

000252



PATH

Compliance Monitoring Form

Authorization

Report Date: Page 1 of 6
2019/08/30

Title: Avalanche Shield Rock Groyne/Berm Infill, Bear River Estuary, Stewart
PATH No.: 17-HPAC-00206 Habitat File No.: Receive Date: 2017/03/24

Section A - PATH Main Information Screen

Category:
Prop. Start: Prop. Completion:

Assessor: Mercer, Vance
Fisheries Protection Program Biologist
200 - 401 Burrard Street
Vancouver BC
V6C 3S4 (604) 666-0280

Proponent: Pettit, Brad
Stewart World Port Services Ltd.
11421 Alaska Rd
Fort St. John BC
V1J 6N2

Other Contact:

Local Water: Bear River Estuary
County / Municip.:
Geo. Obj. Type:
Location Detail:
UTM Zone:
UTM Easting:
UTM Northing:

Nearest Community: Stewart
Province / Territory: British Columbia
Latitude/Longitude:
Legal Description:
Decimal Latitude:
Decimal Longitude:

Act/Reg. Para./Sec. Act or Regulation Paragraphs or Sections

Section B - PATH Action Log Record

Action ID No.: 55 Action Date: 2018/04/13
Action: Authorized - Fisheries Act Authorization Issued

From: Effective Date: 2018/04/13
To: Expiry Date: 2019/04/01
Compensation: ☒

Auth. Rationale: CEAA EA is not required - NOT on Federal Lands



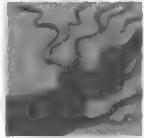
Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management

000253



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Page 2 of 6

Title: Avalanche Shield Rock Groyne/Berm Infill, Bear River Estuary, Stewart
PATH No.: 17-HPAC-00206

Habitat File No.:

Receive Date: 2017/03/24

Section C - Complete at site visit and enter on Site Visit screen in PATH

Date of Site Visit:

Visited by:

Who else was on site? (ie. Proponent representative, etc.)

Were photos taken or provided? (Note: Digital photos can be saved on the PATH Picture screen)

☐ Yes

☐ No

Was other data collected?

☐ Yes

☐ No

Is a Follow up Site Visit Required?

☐ Yes - Date for planned Follow up visit:

☐ No

General Observations - Enter a brief description (ie. weather, time of day, etc.)

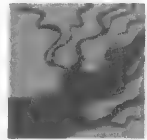


Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Title: Avalanche Shield Rock Groyne/Berm Infill, Bear River Estuary, Stewart
PATH No.: 17-HPAC-00206 Habitat File No.:

Receive Date: 2017/03/24

Section C (Continued) - Enter on Compliance Monitoring screen in PATH

Work Status:

☐ Not Started ☒ In Progress ☐ Completed: ☐ Unknown

Section C - Authorization Issued

1. Were the proposed works/undertakings/activities completed as described in the authorization?

☒ Yes ☐ No ☐ Partial ☐ Unknown

This report addresses the offset measures as-built report. WUAs are not considered in this report.

2. Was the serious harm to fish as described in the authorization?

☒ Yes ☐ No ☐ Partial ☐ Unknown

This report addresses the offset measures as-built report. WUAs are not considered in this report.

3. If Species at Risk Act(SARA) conditions are included in the authorization, were the impacts on aquatic SARA species as described?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

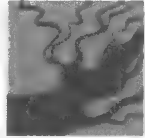
4. Were the measures and standards to avoid and mitigate implemented as described in the authorization?

☒ Yes ☐ No ☐ Partial ☐ Unknown

This report addresses the offset measures as-built report. WUAs are not considered in this report. However, the measures and standards to avoid and mitigate with respect to the offset construction were followed as per the authorization.

5. Were the measures and standards to avoid and mitigate effective in preventing serious harm to fish or impacts to aquatic SARA species?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Title: Avalanche Shield Rock Groyne/Berm Infill, Bear River Estuary, Stewart
PATH No.: 17-HPAC-00206

Habitat File No.:

Receive Date: 2017/03/24

6. If included in the authorization, were the contingency measures implemented?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

No contingency measures have been required

7. Were the contingency measures effective in preventing serious harm to fish or impacts to aquatic SARA species?

☐ Yes ☐ No ☐ Unknown ☒ Not Applicable

-

8. Were the offsetting measures implemented as described?

☒ Yes ☐ No ☐ Partial ☐ Unknown ☐ Not Applicable

Review of Offset As-Built Report indicated that the Parcel C Offset measures had a surplus by 103m² over what was proposed.

9. Were the offsetting measures effective?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

As-built report. Not an effectiveness monitoring report.

10. How was the effectiveness of the measures assessed?

☐ Observational ☐ Functional ☐ Direct ☐ Other ☒ Not Applicable

As-built report. Not an effectiveness monitoring report.

Section C (Continued)

1. Is there a compliance issue with the Fisheries Act?

☐ Yes ☒ No ☐ Unknown



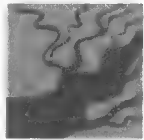
Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management

000256



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Title: Avalanche Shield Rock Groyne/Berm Infill, Bear River Estuary, Stewart
PATH No.: 17-HPAC-00206 Habitat File No.:

Receive Date: 2017/03/24

—

2. Is there a compliance issue with the Species at Risk Act?

☐ Yes ☒ No ☐ Unknown

—

3. Did the proponent notify DFO?

☐ Yes ☐ No ☐ Unknown ☒ Not Applicable

—

4. Select the section(s) of the Fisheries Act and/or the Species at Risk Act where non-compliance applies.

☐ FA21 ☐ FA20 ☐ FA35 ☐ FA38 ☐ Not Applicable
☐ SARA32 ☐ SARA33 ☐ SARA58

—

5. If there is a compliance issue with the Fisheries Act or the Species at Risk Act, will there be further compliance action recommended?

☐ Yes ☐ No ☐ Unknown ☒ Not Applicable

—



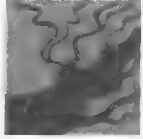
Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management

000257



PATH

Compliance Monitoring Form

Authorization

Report Date: Page 6 of 6
2019/08/30

Title: Avalanche Shield Rock Groyne/Berm Infill, Bear River Estuary, Stewart
PATH No.: 17-HPAC-00206 Habitat File No.: Receive Date: 2017/03/24

6. Is a follow up site visit required?

☐ Yes ☒ No

7. Is compliance monitoring now complete on this action?

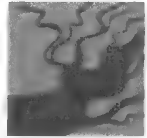
☐ Yes ☒ No

A site visit is recommended to observe the offset in the summer and do some effectiveness monitoring.

Section D

Description:

Action Log:



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Title: Avalanche Shield Rock Groyne/Berm Infill, Bear River Estuary, Stewart
 PATH No.: 17-HPAC-00206 Habitat File No.: Receive Date: 2017/03/24

Section A - PATH Main Information Screen

Category:		Prop. Completion:	
Prop. Start:			
Assessor:	Mercer, Vance Fisheries Protection Program Biologist 200 - 401 Burrard Street Vancouver BC V6C 3S4 (604) 666-0280	Proponent:	Pettit, Brad Stewart World Port Services Ltd. 11421 Alaska Rd Fort St. John BC V1J 6N2
		Other Contact:	
Local Water:	Bear River Estuary	Nearest Community:	Stewart
County / Municip.:		Province / Territory:	British Columbia
Geo. Obj. Type:		Latitude/Longitude:	
Location Detail:		Legal Description:	
UTM Zone:		Decimal Latitude:	
UTM Easting:		Decimal Longitude:	
UTM Northing:			
<u>Act/Reg.</u>	<u>Para./Sec.</u>	<u>Act or Regulation</u>	<u>Paragraphs or Sections</u>

Section B - PATH Action Log Record

Action ID No.:	55	Action Date:	2018/04/13
Action:	Authorized - Fisheries Act Authorization Issued		
From:	Effective Date:	2018/04/13	
To:	Expiry Date:	2019/04/01	
	Compensation:	<input checked="" type="checkbox"/>	
Auth. Rationale:	CEAA EA is not required - NOT on Federal Lands		



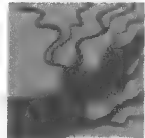
Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management

000259



PATH

Compliance Monitoring Form

Authorization

Report Date:

Page 2 of 6
2019/08/30

Title: **Avalanche Shield Rock Groyne/Berm Infill, Bear River Estuary, Stewart**
PATH No.: **17-HPAC-00206** Habitat File No.:

Receive Date: **2017/03/24**

Section C - Complete at site visit and enter on Site Visit screen in PATH

Date of Site Visit:

Visited by:

Who else was on site? (ie. Proponent representative, etc.)

Were photos taken or provided? (Note: Digital photos can be saved on the PATH Picture screen)

☐ Yes

☐ No

Was other data collected?

☐ Yes

☐ No

Is a Follow up Site Visit Required?

☐ Yes - Date for planned Follow up visit:

☐ No

General Observations - Enter a brief description (ie. weather, time of day, etc.)

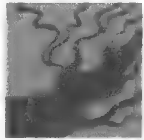


Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Title: Avalanche Shield Rock Groyne/Berm Infill, Bear River Estuary, Stewart
PATH No.: 17-HPAC-00206

Habitat File No.:

Receive Date: 2017/03/24

Section C (Continued) - Enter on Compliance Monitoring screen in PATH

Work Status:

☐ Not Started ☐ In Progress ☒ Completed: ☐ Unknown

Section C - Authorization Issued

1. Were the proposed works/undertakings/activities completed as described in the authorization?

☒ Yes ☐ No ☐ Partial ☐ Unknown

The post-construction monitoring report stated that the authorized works has occurred as described. No other information was provided.

2. Was the serious harm to fish as described in the authorization?

☒ Yes ☐ No ☐ Partial ☐ Unknown

The post-construction monitoring report stated that the authorized works has occurred as described. No other information was provided.

3. If Species at Risk Act(SARA) conditions are included in the authorization, were the impacts on aquatic SARA species as described?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

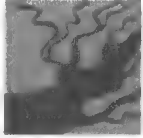
4. Were the measures and standards to avoid and mitigate implemented as described in the authorization?

☒ Yes ☐ No ☐ Partial ☐ Unknown

Yes the measures and standards to avoid and mitigate implemented as described in the authorization.

5. Were the measures and standards to avoid and mitigate effective in preventing serious harm to fish or impacts to aquatic SARA species?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable



PATH

Compliance Monitoring Form

Authorization

Report Date: 2019/08/30

Title: Avalanche Shield Rock Groyne/Berm Infill, Bear River Estuary, Stewart
PATH No.: 17-HPAC-00206 Habitat File No.:

Receive Date: 2017/03/24

6. If included in the authorization, were the contingency measures implemented?

☐ Yes ☒ No ☐ Partial ☐ Unknown ☐ Not Applicable

The post-construction monitoring report stated that the authorized works has occurred as described. No contingency measures were implemented.

7. Were the contingency measures effective in preventing serious harm to fish or impacts to aquatic SARA species?

☐ Yes ☐ No ☐ Unknown ☒ Not Applicable

-

8. Were the offsetting measures implemented as described?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

This review is for the post-construction report for the authorized works (not the offsetting). Offsetting works to be completed in Nov 2018

9. Were the offsetting measures effective?

☐ Yes ☐ No ☐ Partial ☐ Unknown ☒ Not Applicable

the Parcel C offsets have not been constructed (planned for November 2018).

10. How was the effectiveness of the measures assessed?

☐ Observational ☐ Functional ☐ Direct ☐ Other ☒ Not Applicable

the Parcel C offsets have not been constructed (planned for November).

Section C (Continued)

1. Is there a compliance issue with the Fisheries Act?

☐ Yes ☒ No ☐ Unknown

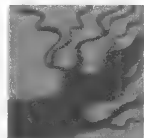


Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management



PATH

Compliance Monitoring Form

Authorization

Report Date:

Page 5 of 6
2019/08/30

Title: Avalanche Shield Rock Groyne/Berm Infill, Bear River Estuary, Stewart
PATH No.: 17-HPAC-00206 Habitat File No.:

Receive Date: 2017/03/24

—

2. Is there a compliance issue with the Species at Risk Act?

☐ Yes

☒ No

☐ Unknown

—

3. Did the proponent notify DFO?

☐ Yes

☐ No

☐ Unknown

☒ Not Applicable

—

4. Select the section(s) of the Fisheries Act and/or the Species at Risk Act where non-compliance applies.

☐ FA21

☐ FA20

☐ FA35

☐ FA38

☐ Not Applicable

☐ SARA32

☐ SARA33

☐ SARA58

—

5. If there is a compliance issue with the Fisheries Act or the Species at Risk Act, will there be further compliance action recommended?

☐ Yes

☐ No

☐ Unknown

☒ Not Applicable

—

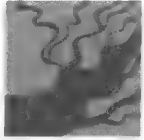


Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management



PATH

Compliance Monitoring Form

Authorization

Report Date:

Page 6 of 6
2019/08/30

Title: **Avalanche Shield Rock Groyne/Berm Infill, Bear River Estuary, Stewart**
PATH No.: **17-HPAC-00206** Habitat File No.:

Receive Date: **2017/03/24**

6. Is a follow up site visit required?

☐ Yes

☒ No

7. Is compliance monitoring now complete on this action?

☐ Yes

☒ No

A site visit is planned for Sept 26, 2018

Section D

Description:

Action Log:



Fisheries
and Oceans

Pêches
et Océans

Warning: Information in PATH may be private and/or sensitive and should not be shared without appropriate consultation and/or permission. Refer to the Data and System Security section of the PATH Helpfiles for details

Habitat Management



Fisheries and Oceans Canada
Pêches et Océans Canada

3190 Hammond Bay Road
Nanaimo, BC V9T 6N7

MAR 30 2017

Your file *Voire référence*

Our file *Notre référence*
12-HPAC-PA4-00248
16-HPAC-00732

Brad Pettit, Director, Port Operations
Stewart World Port Services Ltd.
11421 Alaska Road
Fort St. John, BC, V1J 6N2

Delivered via email: bpettit@stewartworldport.com

Dear Mr. Pettit:

**Subject: Notification of modifications to dates in conditions of Paragraph 35(2)(b)
Fisheries Act authorizations (12-HPAC-PA4-00248 and 16-HPAC-00732)**

The Fisheries Protection Program (the Program) of Fisheries and Oceans Canada hereby modifies the condition that relates to the period during which the offsetting measures must be completed.

Due to seasonal environmental factors (i.e. frozen ground and heavy snow load) the timing window for offsetting construction has been further extended from March 31 to April 30, 2017.

The Program has determined that the modification of the offsetting construction date in the conditions of authorization will not increase the level of harm to fish and habitat described in both authorizations.

A copy of both authorizations and a copy of this letter must be kept on site while the work is in progress. Work crews must be familiar with and able to adhere to the conditions.

Failure to comply with the conditions of both authorizations may lead to prosecution under the *Fisheries Act*.

Canada

If you or anyone conducting work on your behalf have any questions, please contact Boone Barber at our Nanaimo office at (250) 756-7267, or by email at boone.barber@dfo-mpo.gc.ca.

Yours sincerely,



Alain (Al) Magnan, R.P.Bio.
A/Regulatory Manager
Fisheries Protection Program

Attached: Monitoring & Reporting Schedule

Monitoring & Reporting Schedule
16-HPAC-00732 and 12-HPAC-PA4-00248

Activity	Due Date
Letter of Credit	Received
Post-Construction As-Built Survey Report	July 31, 2017
Year 1 Habitat Effectiveness Report	September 30, 2018
Year 3 Habitat Effectiveness Report	September 30, 2020
Year 5 Habitat Effectiveness Report	September 30, 2022

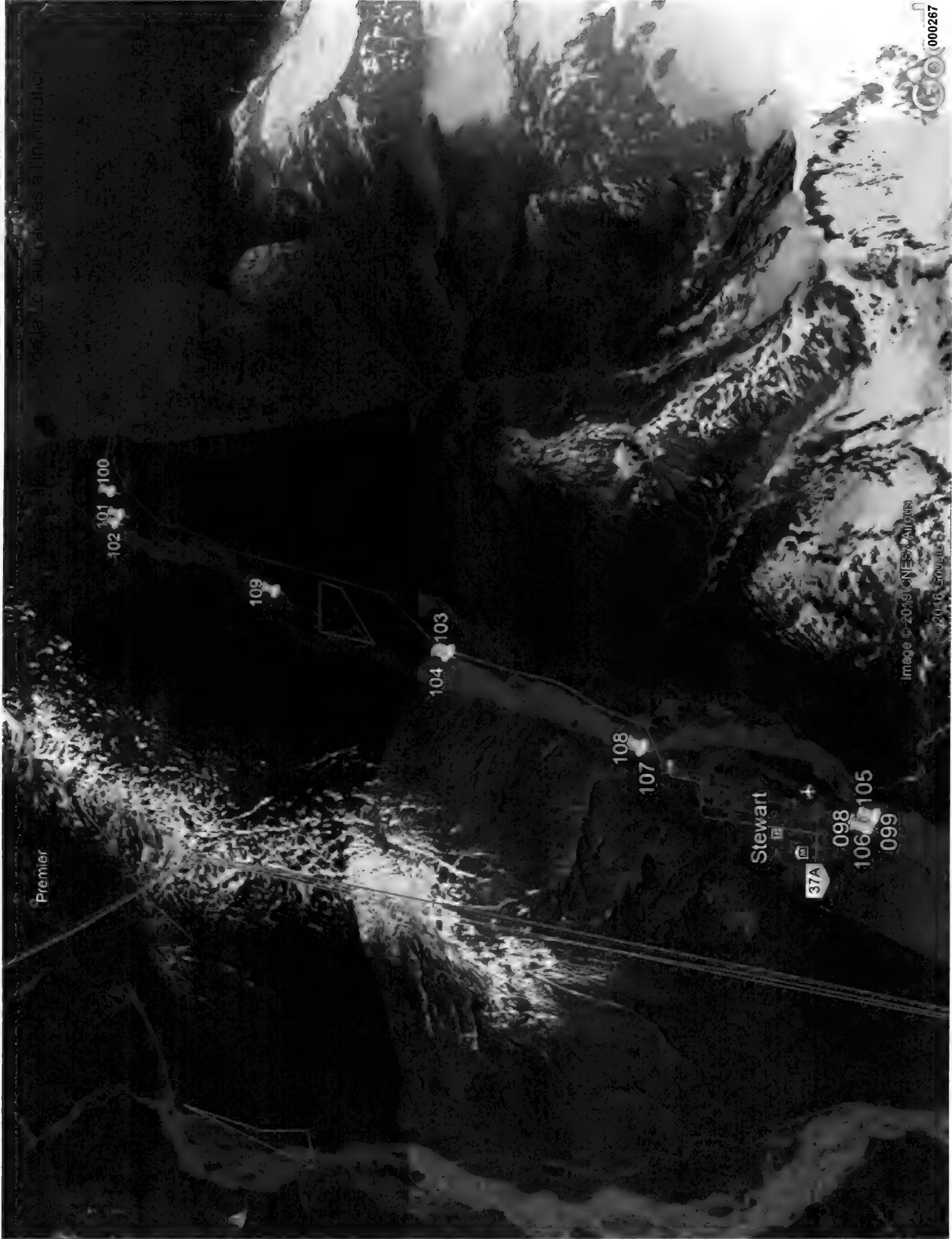


Image © 2019 CNES/Airbus

© 2018 Google

July 31, 2017 Site Visit; Boone Barber, Darren Chow, Renny Talbot

Photo #	Description
15, 16	Culvert looking upstream from outlet
17	Looking downstream from road culvert crossing at offset within tidal area
18	Looking east from WP 99
19	Looking west from WP99 at pool and towards culvert inlet
20	Looking north/upstream at Western Ditch from WP 96
21	Looking downstream at Western Ditch from WP 97
22	Looking south at Parcel B/Southern Pond from WP 98
23	Looking upstream at culvert inlet from road

August 1, 2017 Site Visit

Purpose: Look at two culverts located at the eastern extent of Parcel B.

Photo #	Description
31	Southern culvert looking through inlet from WP 106
32	Northern culvert looking through inlet from WP 106
33	Culvert outlet in foreground looking at Bear River mainstem in background from WP 105
34	Looking south from culvert outlets. Bear River mainstem in background from WP 105
35	Delete
36	Southern culvert looking from outlet from WP 105
37	Northern culvert outlet from WP 105
38	Northern culvert outlet – plugged from WP 105
39	North and south culvert inlets looking west at Parcel B habitat work from WP 106

07.31.2017 14:30

07-31-2017 14:29





07:31:2017 14:34



07-31-2019 14:36



2017 07 31 14:38



09/31/2017 14:40



07/31/2017 14:45

201

tu



07-31-2017 14:48

08.01.2017 08:51

08.01.2017 08.32



08.01.2017 08:53

08_01_2017 08:54



08.01.2017 08.59

08.01.2017 08:55



03/01/2017 08:55



08 01 2017 08:56



08-01-2017 08:57



Fisheries and Oceans Pêches et Océans
Canada Canada

Authorization No.: 17-HPAC-00206

PARAGRAPH 35(2)(b) *FISHERIES ACT* AUTHORIZATION

Authorization issued to:

Stewart World Port Services Ltd. (hereafter referred to as the "Proponent")

Attention to: Brad Moffat, Director, Port Operations
Stewart World Port Services Ltd.
11421 Alaska Road
Fort Saint John, BC
V1J 6N2

Location of Proposed Project

Nearest community (city, town, village): Stewart, BC
Municipality, district, township, county: District of Stewart
Province: British Columbia
Name of watercourse, waterbody: Portland Canal / Bear River estuary
Longitude and latitude: 55°55'01.8"N 129°59'36.2"W

Description of Proposed Project

The proposed project of which the work, undertaking or activity authorized is a part involves:

- an Avalanche Shield at the head of Portland Canal and in the Bear River estuary.

Description of Authorized work(s), undertaking(s) or activity(ies) likely to result in serious harm to fish

The work(s), undertaking(s), or activity(ies) associated with the proposed project described above that are likely to result in serious harm to fish and are the subject of this Authorization are:

- the work(s), undertaking(s), or activity(ies) to construct a rock groyne (the "rock groyne") as described in the following Keystone Environmental documents:
 - "Aquatic Effects Assessment Stewart World Port Avalanche Shield Project Stewart World Port Stewart, BC" prepared for Stewart World Port Services Ltd. Project No. 12336 dated December 2017 as amended by the PDM Services Ltd. Avalanche Shield Groyne Stewart Harbour Stewart, BC Drawings:

Canada

- DWG # : 2017-SWP-4-001.Rev1 "Attachment: Plan View Avalanche Shield Groyne Stewart BC" dated January 5, 2018.
- DWG # : 2017-SWP-4-001.Rev1 "Attachment: Section Views Avalanche Shield Groyne Stewart BC" dated January 5, 2018.
- "Response to FPP October 2017 Comments Stewart World Port Facility Avalanche Shield Project (DFO File No. 17-HPAC-00206) Stewart World Port Stewart, BC" prepared for Stewart World Port Services Ltd. Project No. 12336 dated December 2017.

The serious harm to fish likely to result from the proposed work(s), undertaking(s), or activity(ies), and covered by this Authorization includes:

- the permanent alteration and destruction of a maximum of 7,645 m² of intertidal fish habitat.

Conditions of Authorization

The above described work, undertaking or activity that is likely to result in serious harm to fish must be carried on in accordance with the following conditions.

1. Conditions that relate to the period during which the work, undertaking or activity that will result in serious harm to fish can be carried on:

The work(s), undertaking(s) or activity(ies) that results in serious harm to fish is authorized to be carried on during the following period:

From:
Date of Issuance

To:
April 01, 2019

If the Proponent cannot complete the work, undertaking or activity during this period, Fisheries and Oceans Canada (DFO) must be notified in advance of the expiration of the above time period. DFO may, where appropriate, provide written notice that the period to carry on the work, undertaking or activity has been extended.

The periods during which other conditions of this Authorization must be complied with are provided in their respective sections below. DFO may, where appropriate, provide written notice that these periods have been extended, in order to correspond to the extension of the period to carry on a work, undertaking, or activity.

2. Conditions that relate to measures and standards to avoid and mitigate serious harm to fish:

- 2.1 The mitigation measures specified in the Keystone Environmental document titled "Aquatic Effects Assessment Stewart World Port Avalanche Shield Project Stewart World Port Stewart, BC" prepared for Stewart World Port Services Ltd. Project No. 12336 dated December 2017 to prevent the un-authorized serious harm to fish are to be implemented. The mitigation measures to be implemented shall include, but are not limited to, the following:

- 2.1.1 Work(s), undertaking(s) or activity(ies) are to be undertaken in the dry or above the sea/river water level when tide level and/or Bear River water level allows.
 - 2.1.2 Rock or other materials used to construct the rock groyne shall be non-acid generating and shall not leach substances that are harmful to fish.
 - 2.1.3 Machinery or equipment shall not operate from outside of the footprint of the previously constructed groyne or the rock groyne.
 - 2.1.4 The generation of sediment-laden water or turbid water as a result of the work(s), undertaking(s) or activity(ies) must not result in the serious harm to fish.
 - 2.1.5 Work(s), undertaking(s) or activity(ies) shall be ceased if any marine mammal is observed immediately adjacent to the activities such that there is a risk of physical harm from direct contact, and only resume once the animal has left the immediate area or has not been re-sighted for 30 minutes.
 - 2.1.6 The portion of the previously constructed groyne, comprised of a footprint of up to 192 m², outside of the footprint of the rock groyne shall be removed and be removed in a manner that restores the disturbed sea/river bed to an elevation that is similar to the elevation of the adjacent sea/river bed and in a manner that does not strand fish on the sea/river bed.
 - 2.1.7 Work(s), undertaking(s) or activity(ies) shall be conducted in a manner that does not result in the death of finfish.
 - 2.1.8 An Environmental Monitor is to be present full-time during all construction activities below the high water mark or below +7.6 metres chart datum. The Environmental Monitor shall monitor for stranding or mortality of finfish until completion of the rock groyne regardless of whether work(s), undertaking(s) or activity(ies) to construct the rock groyne are being undertaken. The Environmental Monitor shall direct those people conducting work(s), undertaking(s) or activity(ies) to implement the mitigation measures necessary to prevent the un-authorized serious harm to fish. The Environmental Monitor shall ensure compliance with the mitigation measures included as Conditions of this Authorization. The Environmental Monitor shall be empowered in writing to stop the un-authorized serious harm to fish.
- 2.2 Contingency measures shall be put in place if monitoring required in condition 3 below indicates that the measures and standards to avoid and mitigate serious harm to fish are not successful. Contingency measures shall include those specified in the Keystone Environmental document titled "Aquatic Effects Assessment Stewart World Port Avalanche Shield Project Stewart World Port Stewart, BC" prepared for Stewart World Port Services Ltd. Project No. 12336 dated December 2017 including, but not limited to, the following:
- stopping works to prevent the un-authorized serious harm to fish or to prevent the disturbance to marine mammals.

- salvaging finfish that become stranded as a result of the work(s), undertaking(s) or activity(ies) to prevent the death of fish.

3. Conditions that relate to monitoring and reporting of measures and standards to avoid and mitigate serious harm to fish:

3.1 The Proponent shall monitor the avoidance and mitigation measures referred to in section 2 of this Authorization and submit a written report to DFO via email at referralspecific@dfo-mpo.gc.ca, or at an alternate email address specified by DFO, by October 01, 2018 unless otherwise specified by DFO, indicating whether the measures and standards to avoid and mitigate serious harm to fish were conducted according to the conditions of this Authorization. This shall be done, by:

- 3.1.1 Providing dated photographs and inspection reports to demonstrate effective implementation and functioning of mitigation measures and standards described above to limit the serious harm to fish to what is authorized by this Authorization.
- 3.1.2 Providing details of any contingency measures that were followed, to prevent the serious harm to fish greater than that authorized by this Authorization in the event that mitigation measures did not function as described.

3.2 To confirm that the rock groyne, after construction, is not resulting in degradation of adjacent fish habitat due to hydrological changes (e.g. changes in sediment deposition/erosion, changes to existing flow patterns, etc.), a hydrographic survey in Portland Canal and at the mouth of the Bear River covering the area as shown in Figure 5 of and using the methodology as described in Section 5 of the Northwest Hydraulic Consultants Ltd. letter to Stewart World Port regarding "Stewart World Port Groyne Fluvial Geomorphic Monitoring Plan" dated 10 September 2016 shall be undertaken except that:

- data collection is to be carried out after construction of the rock groyne in August or September 2018, 2019, 2020 & 2021 unless otherwise specified by DFO.
- interim reports summarizing the data collected are to be prepared and submitted to DFO via email at referralspecific@dfo-mpo.gc.ca, or at an alternate email address specified by DFO, within 5 months after each time data is collected or unless otherwise specified by DFO.
- prior to January 15, 2022 or unless otherwise specified by DFO, the data collected is to be reviewed and summarized in a monitoring report that identifies any clear trends in the data collected and/or establishes a survey and reporting schedule for additional monitoring and the monitoring report is to be submitted to DFO via email at referralspecific@dfo-mpo.gc.ca, or an alternate email address specified by DFO.

Should DFO determine that degradation of fish habitat has occurred adjacent to the rock groyne as a result of the constructed rock groyne, the Proponent shall continue to conduct the hydrographic survey as described above beyond 2021 and/or implement offsetting measures in addition to those described in Condition 4.2 as required by DFO.

4. Conditions that relate to the offsetting for the serious harm to fish likely to result from the authorized work, undertaking or activity:

- 4.1 DFO may draw upon funds set aside by the Proponent through the letter of credit provided as part of the application for this Authorization, to cover the costs of implementing the offsetting measures required to be implemented under this Authorization including the associated monitoring and reporting measures.
 - 4.2 Offsetting measures, comprised of fish habitat improvements to an existing wetland pond, shall be a) carried out according to the Proponent's offsetting plan approved by DFO as described in the Keystone Environmental document titled "Habitat Offsetting Plan Avalanche Shield Project Stewart, BC" dated January 2018 and b) completed prior to December 31, 2018.
 - 4.3 All offsetting measures shall be completed and be functioning according to the criteria in Section 5 of the Keystone Environmental document titled "Habitat Offsetting Plan Avalanche Shield Project Stewart, BC" dated January 2018 except that the offsetting measures shall be completed by December 31, 2018 unless this date is extended by DFO.
 - 4.4 If the results of monitoring as required in condition 5 indicate that the offsetting measures are not completed by the date specified and/or are not functioning according to the above criteria in 4.3, the Proponent shall give written notice to DFO and put in place contingency measures and associated monitoring measures, as contained within their approved offsetting plan, to ensure the offsetting is completed and/or functioning as required by this Authorization.
 - 4.5 The Proponent shall not carry on any work, undertaking or activity that will adversely disturb or impact the offsetting measures.
- 5. Conditions that relate to monitoring and reporting of offsetting measures (described above in section 4):**
- 5.1 The Proponent shall conduct monitoring of the offsetting measures according to the approved schedule and criteria in the Keystone Environmental document titled "Habitat Offsetting Plan Avalanche Shield Project Stewart, BC" dated January 2018. Specifically, but not limited to, monitoring of the offsetting measures are to be undertaken in spring of 2019, 2020 and 2021 unless otherwise specified by DFO.
 - 5.2 The Proponent shall report to DFO that the offsetting works were conducted according to the conditions of this Authorization as described in the Keystone Environmental document titled "Habitat Offsetting Plan Avalanche Shield Project Stewart, BC" dated January 2018. Specifically, but not limited to, monitoring reports are to be submitted to DFO via email at referralspecific@dfo-mpo.gc.ca, or an alternate email address specified by DFO, prior to September 30 of 2019, 2020, and 2021 unless otherwise specified by DFO.

Authorization Limitations and Application Conditions

The Proponent is solely responsible for plans and specifications relating to this Authorization and for all design, safety and workmanship aspects of all the works associated with this Authorization.

The holder of this Authorization is hereby authorized under the authority of paragraph 35(2)(b) of the Fisheries Act, R.S.C., 1985, c.F. 14 to carry on the works, undertakings and/or activities that are likely to result in serious harm to fish as described herein. This Authorization does not purport to release the applicant from any obligation to obtain permission from or to comply with the requirements of any other regulatory agencies.

This Authorization does not permit the deposit of a deleterious substance in water frequented by fish. Subsection 36(3) of the *Fisheries Act* prohibits the deposit of any deleterious substances into waters frequented by fish unless authorized by regulations made by Governor in Council.

At the date of issuance of this Authorization, no individuals of aquatic species listed under the *Species at Risk Act* (SARA) were identified in the vicinity of the authorized works, undertakings or activities. In the event that any such individuals are identified in this area, or in the event that an aquatic species found in this same area is listed under the SARA after this Authorization is issued, this Authorization does not permit the killing, harming, capture or taking of individuals of any such species (section 32 of the SARA), or the damage or destruction of residence of individuals of such species (s. 33 of the SARA) or the destruction of the critical habitat of any such species (s. 58 of the SARA).]

The failure to comply with any condition of this Authorization constitutes an offence under paragraph 40(3)(a) of the Fisheries Act and may result in charges being laid under the Fisheries Act.

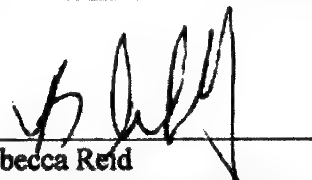
This Authorization must be held on site and work crews must be made familiar with the conditions attached.

This Authorization cannot be transferred or assigned to another party. If the work(s), undertaking(s) or activity(ies) authorized to be conducted pursuant to this Authorization are expected to be sold or transferred, or other circumstances arise that are expected to result in a new Proponent taking over the work(s), undertaking(s) or activity(ies), the Proponent named in this Authorization shall advise DFO in advance.

APR 12 2018

Date of Issuance: _____

Approved by: _____


 Rebecca Reid
 Regional Director General
 Pacific Region
 Fisheries and Oceans Canada



December 11, 2017

Mr. Brad Moffat
Stewart World Port Services Ltd.
11421 Alaska Road
Fort St. John, BC V1J 6N2

Dear Mr. Moffat:

**Re: Aquatics Effects Assessment – Stewart World Port Avalanche Shield Project
Stewart World Port, Stewart, BC
Project No. 12336**

We have enclosed the revised report titled *Aquatics Effects Assessment – Stewart World Port Avalanche Shield Project, Stewart World Port, Stewart, BC* in support of the Project's application for a Request for Authorization under the *Fisheries Act*. We are pleased to submit this report to Stewart World Port Services Ltd. and appreciate the opportunity in providing the service regarding this Project.

Should you have any questions, please do not hesitate to contact the undersigned.

Sincerely,

Keystone Environmental Ltd.

Warren Appleton, R.P.Bio.
Project Manager/ Senior Biologist

I:\12300-12399\12336\Reports\2017 November Aquatic Effects Assessment\12336 171211 FINAL Aquatic Effects Assessment.docx

encl.



**Keystone
Environmental**
Knowledge-Driven Results



***Aquatic Effects Assessment
Stewart World Port Avalanche Shield Project***

Stewart World Port
Stewart, BC

Prepared for: Stewart World Port Services Ltd.

Project No. 12336
December 2017

Environmental Consulting • Engineering Solutions • Environmental Planning

Suite 320
4400 Dominion Street
Burnaby, British Columbia
Canada V5G 4G3

Telephone: 604 430 0671
Facsimile: 604 430 0672
info@keystoneenvironmental.ca

EXECUTIVE SUMMARY

Stewart World Port Ltd. is proposing the construction of an avalanche shield at the Stewart World Port facility in Stewart, BC. The project is proposed to start January 1, 2018 and be completed by February 15, 2018 (i.e. immediately upon obtaining approvals due to the emergency nature of works, which is resulting in real property loss). The project is required for two reasons:

1. There is an immediate (i.e. emergency) need to prevent further deposition of river sediment within the boat basin at the terminal. In 2017 alone, the delta advanced 11 m towards the Port facility. In order to prevent the need for significant dredging of the boat basin, immediate action is required.
2. Hydraulic engineers have advised Stewart World Port they should protect the facility from the term threat of an avalanche east of the facility, and the proposed avalanche shield is the mechanism for doing so.

The construction of the avalanche shield will require placement of large angular rock in the intertidal resulting in a residual net loss of 5,931 m² of intertidal gravel habitat below the high water mark.

The proposed intertidal gravel areas were characterized as marginal fish habitat value. It is void of macro-algae (e.g., no rockweed), vascular plants (e.g., no eelgrass), filter feeders (e.g., no barnacles, mussels or clams), and very few mobile invertebrates (e.g., seastars, crabs). In addition, the substrate is unconsolidated and unstable because additional sediment is deposited by the river on a yearly basis. Further, the water column is constantly turbid from the Bear River preventing photosynthesis. The footprint is also not used for spawning by local fish (e.g., eulachon and salmon spawn further up the Bear River. Rockweed, sea lettuce and barnacles were present on the riprap slopes away from the Bear River freshwater influence.

At the mouth of the Bear River, fish travel into the river in order to head up river to spawn, or, travelling out of the river (directly to sea and directly to the estuary to the west to acclimate to salt water). Therefore, the proposed project is more likely to affect fish migration rather than fish habitat itself.

Broader scale potential impacts considered include the effects of changes of deposition of fines in the estuary to the west, and changes to the Bear River itself that may result due to physical changes at the mouth of the Bear River. Changes to the estuary were found to be not significant, as the turbid water will still settle in the estuary. The expansion of the Bear River itself will be changed temporarily with the new Avalanche shield because the river sediments will be forced to the south instead of the west, increasing the southern expansion rate temporarily (eventually the system will return to equilibrium). The groyne is not expected to back-up the river because the Avalanche shield is not narrowing the river mouth; therefore river conditions upstream of the project are not expected to change.

Temporary impacts will be addressed by implementing proven best management practices and mitigation measures. All intertidal works will occur within the enclosure of a full-height silt curtain that will be installed for the duration of the project. A full-time environmental monitor will conduct

water quality testing around the perimeter of the silt curtain and issue stop-work orders should water quality criteria be exceeded at compliance monitoring stations. The environmental monitor will also check to make sure there are no fish-traps created. The environmental monitor will conduct beach seining to check for fish presence and issue stop-work orders if eulachon or salmon are found within the silt curtain. Monitoring will be carried out as described in the monitoring plan.

The project is expected to result in a residual loss of intertidal gravel habitat of 5,931 m² and will require habitat offsetting. A separate habitat offsetting plan will be provided to describe how the lost residual function will be offset to meet requirements under the *Fisheries Act*.

The following Aquatic Effects Assessment was prepared by Keystone Environmental Ltd. on behalf of SWP, in support of the Project's Request for Review under the *Fisheries Act*.

This Executive Summary is subject to the same general limitations as contained in the report and must be read in conjunction with the entire report.

TABLE OF CONTENTS

	Page
EXECUTIVE SUMMARY	i
TABLE OF CONTENTS.....	iii
List of In-Text Figures	v
List of In-Text Tables.....	v
Appendices	v
LIST OF ACRONYMS.....	vi
1. INTRODUCTION.....	1
1.1 About Stewart World Port.....	1
1.2 Project Justification	3
1.3 Alternative Designs Considered	3
1.4 Consultation	4
1.4.1 Ministry of Forests, Lands, and Natural Resource Operations and Rural Development.....	4
1.4.2 Transport Canada, Navigable Protection Program.....	4
1.4.3 Local Stakeholders	4
1.4.4 First Nations	4
2. PROJECT INFORMATION	5
2.1 Proponent.....	5
2.2 Project Location.....	5
2.3 Access.....	5
2.4 Project Description	5
2.5 Timeline	7
2.6 Future Components.....	7
3. DESCRIPTION OF THE ENVIRONMENT.....	10
3.1 Desktop Review	10
3.1.1 General Results.....	10
3.1.2 Historical Use	11
3.1.2.1 Archaeology.....	11
3.1.3 Hydrology	11
3.1.4 Aquatic Resources	13

TABLE OF CONTENTS (CONT'D)

	Page
3.1.4.1 Commercial, Aboriginal and Recreational Fishery Summary ...	13
3.1.5 Marine Mammals	16
3.1.6 Other Wildlife	17
3.1.7 Species at Risk	17
3.2 Biophysical Conditions at the Project Site	20
4. ASSESSMENT OF POTENTIAL ENVIRONMENTAL EFFECTS	22
4.1 Potential Project Effects on the Aquatic Environment	22
4.1.1 Water Flow	22
4.1.2 Water and Sediment Quality	22
4.1.3 Noise	23
4.1.4 Direct Loss of Habitat and Impact to Fish	23
4.1.5 Impacts to Species at Risk	27
4.1.6 Impacts to Other Marine Mammals	28
4.1.7 Cumulative Impacts	28
4.2 Mitigation Measures	28
4.2.1 Work Window	29
4.2.2 Water and Sediment Quality	29
4.2.3 Noise	33
4.2.4 Direct Loss of Habitat and Impact to Fish	33
4.2.5 Species at Risk	33
4.2.6 Marine Mammals	34
4.2.7 Climate Change	34
4.3 Residual Harm to Fish	34
4.4 Conclusions	35
5. INTERPRETATION AND USE OF STUDY AND REPORT	36
6. REFERENCES	37

LIST OF IN-TEXT FIGURES

	Page
Figure 1	Location Plan.....2
Figure 2	General Arrangement Plan.....8
Figure 3	Cross Sections9
Figure 4	Daily Discharge Graph for Bear River above Bitter Creek (1967–1999).....12
Figure 5	Pacific Herring Spawn Records in the Project Area16
Figure 6	Pre-Construction Habitat25
Figure 7	Post-Construction Habitat26
Figure 8	Mitigation31
Figure 9	Warning and Compliance Water Quality Station Locations relative to Silt Curtain.....32

LIST OF IN-TEXT TABLES

	Page
Table 1	Proponent Information.....5
Table 2	Areas before Construction.....6
Table 3	Project Timeline.....7
Table 4	Species at Risk with Potential to Occur in the Project Area (CDC, 2016).....17
Table 5	Biophysical Conditions Summary21
Table 6	Water Quality Criteria for Turbidity and Suspended Sediments (MOE, 2017)32
Table 7	Habitat Balance Sheet.....34

APPENDICES

Appendix 1	Photographs
Appendix 2	Environmental Monitoring Plan
Appendix 3	Engineered Design Drawings
Appendix 4	Project Justification
Appendix 5	Environmental Response Plan
Appendix 6	Marine Mammal Monitoring Plan
Appendix 7	Eulachon Monitoring Plan

LIST OF ACRONYMS

ARD	Acid Rock Drainage
ASP	Amnesic Shellfish Poisoning
BMPs	Best Management Practices
CD	Chart Datum
CDC	BC Conservation Data Centre
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CRIMS	Coastal Resource Information Management System
CWHwm	Coastal Western Hemlock Biogeoclimatic Zone
DFO	Department of Fisheries and Oceans Canada
DL	District Lot
DoS	District of Stewart
DWT	Dead Weight Tonne
EM	Environmental Monitor
FISS	Fisheries Information Summary System
FMA	Fisheries Management Area
HHWLT	Higher High Water Large Tide
HWM	High Water Mark
MELP	Ministry of Environmental, Land and Parks
MFLNRORD	BC Ministry of Forests, Lands and Natural Resource Operations and Rural Development
MOE	BC Ministry of Environment
MWL	Mean Water Level
NAR	Not at Risk
NHC	Northwest Hydraulic Consultants Ltd.
PAH	Polycyclic Aromatic Hydrocarbons
PSP	Paralytic Shellfish Poisoning
R.P.Bio.	Registered Professional Biologist
SARA	Species at Risk Act
SBPISW	<i>Standards and Best Management Practices for Instream Works</i>
SWP	Stewart World Port
UTM	Universal Transverse Mercator

LIST OF ACRONYMS (CONT'D)

UNITS

ha	Hectare
km	Kilometre
kPa	Kilopascal
m	Metre
m ²	Square metre
m ³	Cubic metre
NTU	Nephelometric Turbidity Units
ppt	Parts per thousand



1. INTRODUCTION

Keystone Environmental Ltd. (Keystone Environmental) was retained by Stewart World Port Services Ltd. (SWP) to complete an Aquatic Effects Assessment in support of the proposed construction of an avalanche shield (the Project) at the Stewart World Port site (the Site) in Stewart, BC. The works are expected to require an Authorization under the *Fisheries Act* (the Authorization) due to the permanent placement of large angular rock over intertidal gravels at the mouth of the Bear River. Habitat offsetting will be described in a separate offsetting plan; this assessment will focus on the Project related aquatic effects.

1.1 About Stewart World Port

SWP is a Canadian company dedicated to responsible port development, management, and operations in Stewart, British Columbia. The multipurpose port facility is located at the end of the Portland Canal two kilometers south of the town of Stewart (Figure 1). As Canada's most northerly ice-free port, Stewart is ideally located at the end of the Portland Canal and has paved access to British Columbia and Alberta. The location provides up to a full day advantage to Asian markets over southern ports and has favourable climate, low winds, and good anchorage. Stewart is located within one of the most mineral rich areas of North America and the Portland Canal has no congestion issues. The port's customers include forestry, mining, oil and gas, and industrial projects.

SWP facilities are located on lands (DL7318 Cassiar District) that are routinely and have been historically used as a marine terminal. As early as 1911, the site has been used as a marine terminal. The Central New England Railway operated from 1911 to 1922 a short line railway along the Bear River Valley. The support piles for the deep sea wharf and access trestle still remain to outline the route across the estuary. These lands are designated for marine use in the District of Stewart Official Community Plan Bylaw No. 650 and have been subject to public consultation. Furthermore, adjacent lands have been established for port development and active industrial marine use since the 1960's.

In 2012, SWP obtained authorization under the *Fisheries Act* to expand the Cassiar dock by infilling to the west to low water and construction of the SWP dock capable of receiving ships in the order of 80,000 DWT. The facility was constructed over the following year and is currently operating today.

Provincially and locally, SWP now directly contributes and supports both the Provincial Government's platform to increase access to skilled jobs, increase wages, and revitalize the forestry industry in BC; and the District of Stewart's economic and revitalization objectives by providing a local export transportation solution for companies operating in Stewart's hinterland. Without the SWP facility, many of the mining companies and wood producers in the area will be left without essential infrastructure. The financial viability of many projects will be compromised due to the increased costs associated with trucking to southern ports. Additionally, there is a significant impact to GHG emissions related to trucking and railing commodities to southern ports.

DRAWN BY ABWA CADD FILE No 123361
PLOT SCALE 1:1



Stewart World Port Stewart, B C Stewart World Port Services Ltd.		
REVISION No 00	DATE Nov 2017	PROJECT No 12336-102

Figure 1
Location Plan

Transfer of avalanche-related risk from the Province of British Columbia to municipalities and from municipalities to industry resulted in the District of Stewart formally requiring SWP to submit an Avalanche Safety Plan for its port facility in 2015. The objective of the Avalanche Safety Plan is described as follows: "The objective of this Avalanche Safety Plan is to identify how SWP minimizes worker exposure to risk from the effects of snow avalanches. SWP achieves this objective by following the WorkSafe BC (WSBC) Occupational Health and Safety Regulation (OHSR) and Guidelines, ..., and industry best practices." (Northwest Avalanche Solutions Ltd, 2015). Analysis and reports generated by qualified avalanche specialists during the creation of the formal Avalanche Safety Plan stated that, "... the effects of displacement waves likely present the greater risk to Stewart World Port workers and facilities" and "An enhancement of the breakwater, including the lengthening and raising of the existing structure, would provide some degree of wave height reduction, and therefore reduction of risk to infrastructure and workers at the wharf" (Dynamic Avalanche Consulting Ltd., 2015).

1.2 Project Justification

There is both an immediate need and a long term need for the avalanche shield at the SWP facility in Stewart, BC:

1. Immediate (emergency) diversion of sediment from the Bear River beyond the SWP boat basin, and,
2. Long-term avalanche protection

Recent work by PDM services has identified an immediate "emergency" need to divert sediment being deposited in the SWP boat basin (Appendix 4). The boat basin is being infilled from sediment carried by the Bear River under the SWP dock. In 2017, the westerly advance of the Bear River front was 11 m. At this rate, the facility will require yearly dredging to stay in operation. From both an economic and environmental perspective, a permanent solution that does not involve dredging seems reasonable. This can be achieved by construction of a groyne, called the "avalanche shield", to divert the flow of the Bear River further to the south beyond the SWP dock.

Long term, the avalanche shield would also protect the port facility from an avalanche threat to the east. The proposed avalanche shield will provide a critically important safety measure for the existing wharf by dispersing or eliminating the threat to human life from a displacement wave that could result from the Arrow slide path. Protection of the port facility from avalanches has been made a requirement from the District of Stewart.

1.3 Alternative Designs Considered

The alternative to the avalanche shield is to let the boat basin infill with river sediments and conduct yearly dredging, and, leave the port exposed to the risks associated with an avalanche. Dredging would result in the generation of turbidity above water quality standards for the protection of aquatic life. Volumes would be significant and in the order of 49,000 m³ per year with yearly costs exceeding 2.5 million per year to maintain.

Another alternative is to install a sheet pile wall or pile wall to divert the flows instead of constructing a rock mound groyne. Such a wall may have difficulty withstanding the lateral forces applied by an avalanche. The cost to purchase steel, ship to Stewart and have a marine contractor install them is expensive. Vertical surfaces would reflect waves, causing erosion at the toe of these structures.

The above options are not viable, therefore the proposed avalanche shield constructed out of angular rock is proposed.

1.4 Consultation

SWP has had consultation with interested parties regarding the proposed project. A summary of the extent of those discussions is provided below.

1.4.1 Ministry of Forests, Lands, and Natural Resource Operations and Rural Development

Applications for a Licence of Occupation and Changes In and About a Stream have been submitted to the Ministry of Forests, Lands Natural Resource Operations and Rural Development (MFLNRORD) (Front Counter Tracking Nos. 100205158 & 100205161 MFLNRO, 2017) for Crown land Industrial application, 0.56 ha in size.

1.4.2 Transport Canada, Navigable Protection Program

A Notice of Work regarding the project was submitted to the Pacific Region Transport Canada, Navigable Protection Program April 6, 2017.

1.4.3 Local Stakeholders

SWP has regular communications, meetings, and dealing with local businesses and harbour users and frequently attends District of Stewart council meetings. SWP has not received any opposition related to the Project.

1.4.4 First Nations

SWP communicates regularly with the Nisga'a Lisims Government (the Nisga'a) and regularly informs them of all its activities within the District of Stewart. SWP is bound by confidentiality agreement with the Nisga'a. Please contact the Nisga'a directly for any further information regarding the Project.

2. PROJECT INFORMATION

2.1 Proponent

The project proponent is Stewart World Port Ltd. The primary contact is provided in Table 1:

Table 1 Proponent Information

Type	Description
Name	Brad Pettit
Role	Director, Port Operation
Company	Stewart World Port Ltd.
Mobile	250-961-0215
Email	bpettit@stewartworldport.com
Field Office	250-636-2228
Field Office Mailbox	PO Box 7 #1 Railway Street Stewart, BC V0T 1W0

2.2 Project Location

The SWP is a deep sea port located at the head of Portland Canal, near Stewart, BC, on District Lots 7318 and 7393 in the District of Stewart (DoS; Figure 1). The proposed avalanche shield is located at the southeast corner of DL7318 at the end of Railway Street, 1 km south from Stewart town center. The Site is bordered by an access road to the north; the Bear River Estuary and steep Coast Mountains to the east; the old Bear River delta to the west; and, Portland Canal to the south. The Project Site is located within the District of Stewart boundaries, and consists of an undeveloped intertidal portion of the Bear River Estuary (Universal Transverse Mercator – UTM coordinates 9U 437839E 6197342 N).

2.3 Access

The Site is accessible by sea, through Portland Canal, and by land from the town of Kitwanga on Highway 16 heading north on Highway 37 to the Meziadin Junction, then west onto Highway 37A through the town of Stewart and to the end of Railway Street.

2.4 Project Description

The purpose of the Project is to construct an avalanche shield (groyne constructed from large angular rock to address immediate and long term needs of the port facility).

The total area below the high water mark (HWM) that will be filled is 7,453 m² for the existing groyne, plus removing 192 m² of the previously constructed groyne constructed in July 2016 that has resulted in a “hook” or spur,” for a total of 7,645 m². A general arrangement plan

showing the proposed activities is included in Figure 2 and design drawings from PDM are attached in Appendix 3. Cross-sections of the proposed structure are shown in Figure 3 and Appendix 3. Areas of the proposed works are shown in Figure 6 and 7.

The avalanche shield will be approximately 350 m long by approximately 21 to 24 m wide and will be elevated to 5.0 m geodetic / 8.4 m chart datum. It will cover the berm constructed in July 2016, as well as intertidal gravels at the mouth of the Bear River. The work will cover the following areas shown below in Table 2.

Table 2 Areas before Construction

Name	Elevation Range (m CD)	Existing Physical Conditions	Converted to	Area of Project Footprint (m ²)
Intertidal gravel	1.0 – 3.0	Pebble dominant, cobble, sand and silt less common, shallow slope, wave exposed, low salinity	Intertidal and Upland Riprap	6,123
Intertidal riprap (existing groyne) within avalanche shield footprint	2.0 – 7.6	Riprap, steep slope, wave exposed, lowest salinity on Bear River side	Intertidal and Upland Riprap	1,330
Intertidal riprap beyond avalanche shield footprint (spur)	2.0	Riprap, steep slope, wave exposed, lowest salinity on Bear River side	Intertidal Gravel	192
Total				7,645

Riprap will be D85 500 kg rocks placed on a 1:1 slope on the Bear River side and D50 500 kg rocks on a 1:1 slope on west side. Project materials will be sourced offsite by others. Imported materials will be tested to confirm they do not result in Acid Rock Drainage (ARD).

Materials will be imported by dump truck down the causeway and end dumped at the avalanche shield. This will create a road down the middle of the groyne starting from shore and working towards the southern end. An excavator will be used to shape the avalanche shield and move rock. The excavator will operate within the footprint of the avalanche shield, placing the fill material first and armouring the exterior with the riprap. The works will be conducted under the supervision of a professional engineer.

The works will be conducted in the dry or in isolation of flow. A full height silt curtain will be installed as shown in Figure 8 to isolate the site. No excavation is anticipated that would result in the potential for fish traps.

By phase, the works will involve the following:

Phase 1 – Site Preparation

- No site preparation works are required other than the installation of mitigation measures (e.g. silt fence along Bear River and silt curtain in intertidal – see Figure 8).

Phase 2 – Construction

- Importing material and construction of the avalanche shield.

Phase 3 – Operation

- The avalanche shield should require minimal maintenance once installed, since rock is inert and stable rock will be used.
- The silt curtain will be removed upon completion of construction.

Phase 4 –Decommissioning

- There are no plans to decommission the avalanche shield.

2.5 Timeline

The timeline for the Project is to start works immediately upon receiving project approvals i.e. January 1, 2018 to February 15, 2018. All in-water works will be restricted within the marine/estuary fisheries winter work window for the Area 3 – Lower Nass (which also includes Portland Canal), **November 30 to February 15** (DFO, 2014b).¹ The work is expected to take a month to complete.

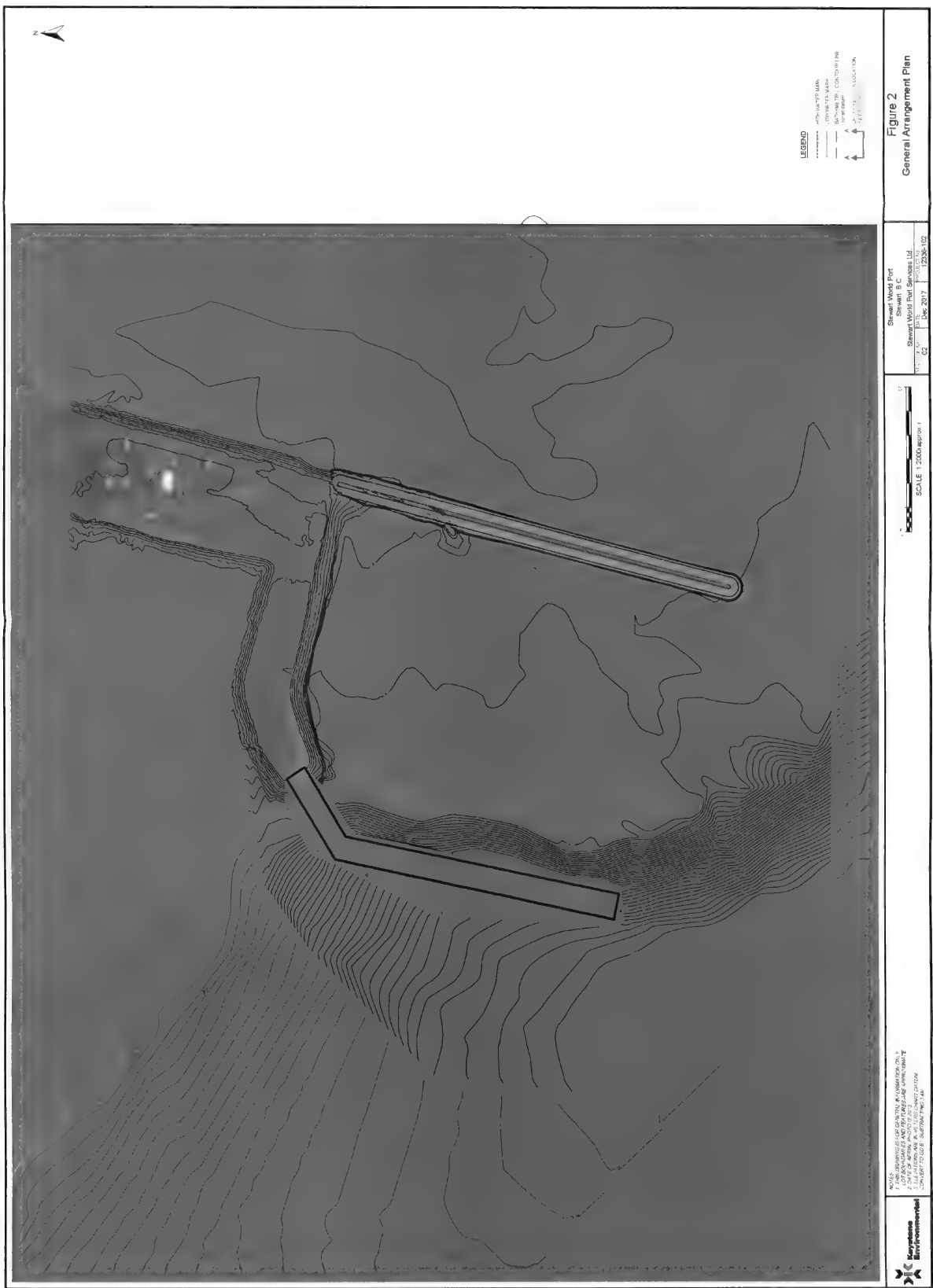
Table 3 Project Timeline

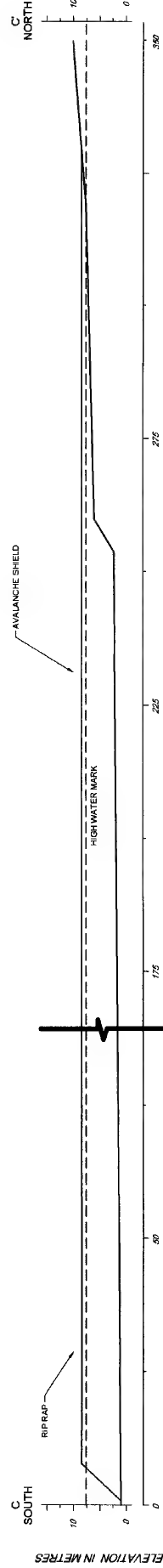
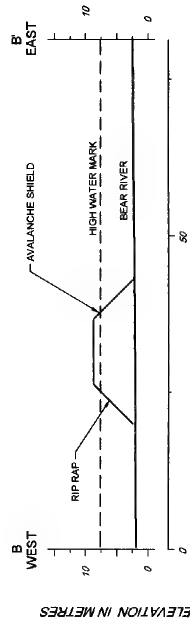
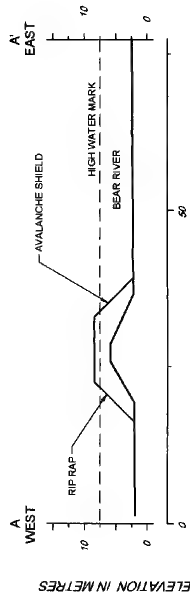
Phase	Start Date	End Date
Site Preparation	January 1, 2018	January 14, 2018
Construction	January 15, 2018	February 15, 2018
Operational	February 16, 2018	None
Decommissioning	None	None

2.6 Future Components

There are no current plans to construct other projects.

¹ No summer window is listed for this area.





NOTES
 1. THE CROSS SECTION SHOWN IS BASED ON INTERPRETATION
 OF LIMITED GEOLOGICAL DATA. ACTUAL CONDITIONS MAY VARY.
 2. ELEVATIONS ARE IN METRES AND ARE TO CHART DATUM.
 3. NOT FOR CONSTRUCTION.



Figure 3
 Cross Sections

Stewart World Port	
Stewart, B.C.	
Stewart World Port Services Ltd.	
REVISION No.	PROJECT No.
02	12338-102
DATE	
Dec 2017	

SCALE: HOR. 1:750

5m 0 10m

3. DESCRIPTION OF THE ENVIRONMENT

3.1 Desktop Review

A review of available literature was conducted to identify existing and potential aquatic resources in the Project area. Resources consulted included, but were not limited to:

- Habitat Wizard, Ministry of Environment (MOE)
- Fisheries Information Summary System (FISS), MOE
- Coastal Resource Information System (CRIMS), BC Government, 2016
- Species at Risk, A Primer for BC, Stewardship Centre for British Columbia
- Government of Canada Species at Risk Public Registry
- BC Species and Ecosystem Explorer, BC Conservation Data Centre (CDC) 2016
- Mapster, Department of Fisheries and Oceans Canada (DFO)
- Hydrographic Services Canada
- Professional reports included in the "References" Section at the end of this report.
- *SWP Management Plan*. Stewart World Port. Industrial – General – Version 2. 12/15/2014.

3.1.1 General Results

The Project is located at the head of Portland Canal (120 km long, separating northern BC and the southern portion of Alaska), and is adjacent to the Bear River Estuary. The area is part of the Northern Coastal Mountains – Boundary Ranges ecoregion (Pacific Maritime Ecozone), which is characterized by a mean annual temperature of -0.5 degrees Celsius at high elevations (averaging 15°C in the summer, to -3.7°C in the winter at low elevations), and mean annual rainfall of 1,000 mm in the eastern part of the Boundary Ranges (Government of Canada, 2013). Stewart has received an average of 1,843 mm of precipitation annually (almost half in the form of snow; Cambria Gordon Ltd., 2006).

The Bear River Watershed (No. 910-999400) is part of MoE Region 6 – Skeena, and drains 708 km² into Portland Canal (MELP and EC, 2000). Bear River headwaters are in Strohn Lake and glaciers in the Cambria Icefield, approximately 30 km from the mouth (Cambria Gordon Ltd., 2006; HAYCO, 1993). Its two main tributaries are Bitter Creek (approximately 12 km north of Stewart) and American Creek (approximately 19 km north of Stewart). The river is heavily braided in its lower 15 km: the mainstem migrated across the current delta – to the east side of the valley – during the first half of the 20th century (Cambria Gordon Ltd., 2006). This has resulted in estuary habitat spanning the entire width of the Portland Canal head, with abundant small back channels and relic channels throughout the area. Tidal influence reaches approximately 1.5 km upstream from the edge of river delta (Cambria Gordon Ltd., 2006). The Bear River Watershed supports several fish species, including Pacific salmon and eulachon.

“Extremely high annual bedload” from the Bear River (deposition rate estimated by HAYCO [1986] at 300,000 m³ annually)² – coupled with the containment of the river via dyking – have caused aggradation in the lower river and annual advancement of the river delta into Portland Canal at an estimated rate of 9 (NHC 2016) to 12 m/year (HAYCO, 1986; Cambria Gordon Ltd., 2006). Bitter Creek was identified as the principal source of sediments (Golder Associates Ltd., 2000).

3.1.2 Historical Use

The town of Stewart was founded during the gold rush in the early 1900s, with a population peaking at approximately 10,000. Rapid development spilled from the valley, onto parts of the tidal flats (via pile-supported facilities), and two “very large” wharves were constructed (DoS, undated-b). Subsequent world wars and economic changes lead to the depopulation of Stewart over time, and to 494 inhabitants as of the last census (2011). Today, little evidence of the past waterfront developments remains. Mining and logging continue to be important drivers in the region. Economic benefits from gravel extraction and transportation are expected to grow in future years (DoS, undated-a).

SWP is located at the site of the old Cassiar Dock, used in the 1980s and 1990s for Cassiar Mine (SWP, 2014). The area west of the SWP has been (and continues to be) heavily utilized as a log dump.

3.1.2.1 Archaeology

It is considered unlikely that archaeological resources are present within the Project Site, based on location and elevations. No concerns identified in previous works.

3.1.3 Hydrology

The Project Site is influenced by tidal heights (mixed, semidiurnal tide cycle), waves and currents in Portland Canal, as well as by water discharged by the Bear River. Higher high water large tide (HHWLT) and mean water level (MWL) have been recorded as 7.6 m and 3.9 m above chart datum (CD), respectively (NHC, 2015). A global sea-level rise of 1.0 m has been widely accepted as the 100-year projection for climate change adaptation guidelines (MOE, 2011).

HAYCO (1993) calculated potential wave height at the head of Portland Canal for flood planning at Stewart; wave height was estimated at 1.6 m (1 in 1-year event), 2.5 m (1 in 25 years), up to 3.0 m (1 in 200 years). The 50 and 200-year ocean flood levels (including the effects of storm-surge) at Stewart were estimated at 9.23 m and 9.41 m CD, respectively (HAYCO, 1993). The same study reported that the maximum water level at Stewart resulting from a tsunami wave was estimated at 2.3 to 4.1 m above mean water level. The area was characterized as “protected” for wave exposure (BC ShoreZone classification standards), with low currents (less than 3 knots; CRIMS, undated).

² Equivalent to 540,000 tonnes/year (Cambria Gordon Ltd., 2006).

Figure 4 provides daily discharge statistics from 1967 and 1999 for Bear River (upstream of Bitter Creek – Station 08DC006; WSC, 2014). Mean annual flow is $25 \text{ m}^3/\text{s}$, and average peak discharges of $63 \text{ m}^3/\text{s}$ occurs in July and August (NHC, 2016). Daily maximum discharges are recorded in September to November (NHC, 2016). Northwest Hydraulic Consultants conducted a three-phase flood and groundwater mitigation plan to address concerns in the town of Stewart after a 2011 flood event. Phase one investigated baseline conditions for Bear River, the estuary, and tidal influence from Portland Channel; phase two provided the town of Stewart with mitigation options for areas of concern (e.g., dike failures, infrastructure upgrades, channel modification, and city planning), and phase three produced an implementation and adaptation plan for selected options (NHC 2016C, 2016D). The Bear River Delta rate of advancement has increased since industrial infrastructure has narrowed the river mouth to 1/3 of its historical area (NHC, 2016B). However, delta advancement greatly exceeds vertical aggradation, so flooding concerns are more closely linked to tidal influences (NHC, 2016B).

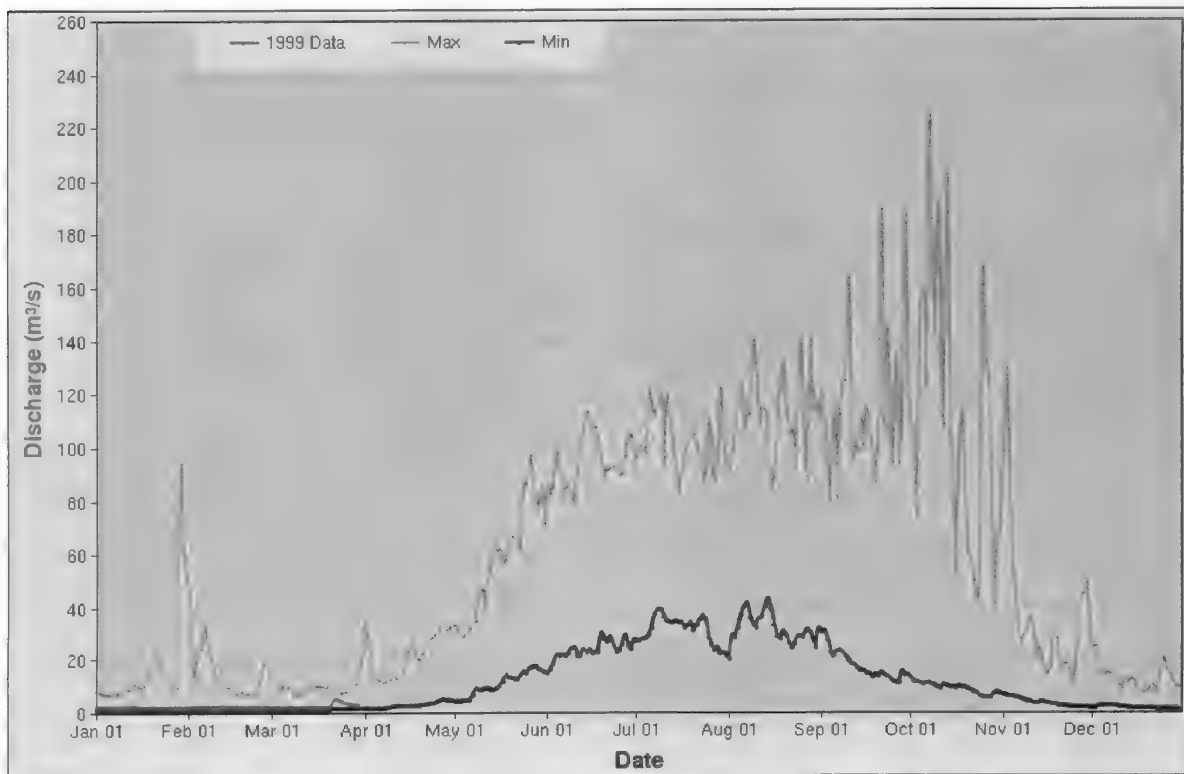


Figure 4 Daily Discharge Graph for Bear River above Bitter Creek (1967–1999)

The Site has the potential to be impacted by the effects of jökulhaups or glacial outburst floods: “sudden drainages of ice-impounded water from Strohn Lake” and/or from the Bitter Creek sub-watershed (NHC, 2015, NHC, 2016B). The flood experienced by the town may have been linked to one of these events (NHC, 2016C).

Water quality monitoring in Bear River near Stewart, between 1987 and 1994 documented high selenium levels – suspected to be mainly natural - often exceeding the selenium criterion for aquatic life (MELP and EC, 2000). High turbidity and associated total metals, total phosphorus and total organic carbons were often recorded, especially during freshet. Salinity in the Project area was classified as polyhaline (18-28 ppt; CRIMS, undated). No water quality data was available for Portland Canal.

Documented sediment at the Project Site is mainly fluvial in origin (i.e., from the Bear River) and composed of sand and gravel (CRIMS, undated). No data was available for sediment quality in Portland Canal.

3.1.4 Aquatic Resources

3.1.4.1 Commercial, Aboriginal and Recreational Fishery Summary

The following fish species have been recorded in the Bear River watershed: sockeye salmon (*Oncorhynchus nerka*), coho salmon (*O. kisutch*), chum salmon (*O. keta*), rainbow/steelhead trout (*O. mykiss*), dolly varden (*Salvelinus malma*), bull trout (*S. flavidus*), mountain whitefish (*Prosopium williamsoni*), and sculpins (possibly *Cottus aleuticus*; MOE 2016a and 2016b). Coho appear to be the most widely distributed and most abundant fish species in the watershed. The Project Site is part of the Portland Sound-Observatory Inlet-Portland Canal Coho Conservation Unit (CU029; Holtby and Ciruna, 2007). Historically, the river may have supported a run of pink salmon (*O. gorbuscha*; Cambria Gordon Ltd., 2006): the Salmon River, Alaska (located approximately 2.5 km south of the Project Site) has records of pink salmon (ADFG, 2016).

Portland Canal is part of Fisheries Management Area; FMA 3-16 (Portland Inlet; DFO, 2016a). All five Pacific salmon species occur in Area 3 and 103 (Alaska border; DFO, 2016b), however, no data was available concerning recent occurrences of chinook salmon (*O. tshawytscha*) and pink salmon in the Project area. The following commercial Licence Areas are listed for the FMA 3 (DFO, 2013):

- Salmon (Seine/ Gill Net/ Toll)
- Crab – Area B
- Food and Bait Herring – North
- Clam – Area A
- Herring Gill Net – Prince Rupert
- Geoduck – Area N

- Roe Herring – Prince Rupert
- Red Sea Urchin – Area N
- Rockfish Area – Outside
- Sea Cucumber – Area P

Eulachon

Although not a commercial species, eulachon (*Thaleichthys pacificus*) is a fish of special significance to First Nations. The Bear River was targeted for bio surveys to investigate the documented (i.e., anecdotal) decrease in eulachon population in the area. Results identified a close evolutionary link between Bear and Nass River populations, but noted distinct differences in size and spawning time (Noble et. al., 2015). Recent surveys (i.e., 2015) have shown the presence of adult eulachons in the Bear River estuary (Anon, Pers. comm., 2016). Eulachon in the Nass and Skeena Rivers have been listed as species of “Special Concern” (downgraded from “Threatened” in the May 2013 assessment; COSEWIC, 2013A). In the absence of data, the Bear River was provisionally included in the Nass/Skeena designatable unit (DU; COSEWIC, 2013A).

Eulachons spend 95% of their lives in the marine environment, and spawn in the lower reaches of glacier-fed rivers. Spawning in the Nass River occurs mid-March to early April, while the Skeena run arrives a little earlier (early March, but as early as mid-February; COSEWIC, 2013A). Spawning timing may vary with timing of spring freshets. Eulachon spawn above the marine influence in river systems, therefore no spawning habitat is located at the Project.

Eulachon is a migratory species; they may use the estuary habitat during their migration to the freshwater reaches of the Bear River (in late winter and/or early spring) and possibly for rearing (in the spring). It is unlikely that returning adults and outmigrating larvae would be impacted by the Project if construction is scheduled within the prescribed window (i.e., November 30 to February 15).

Salmon

The estuary is a key migration route for out-migrating juvenile salmon and returning adults. Adult anadromous salmonids may use the area for holding, before migrating upstream to spawning grounds, while juveniles may use the estuary for rearing, for various length of time (depending on the species and life history type). A habitat inventory in the Bear River Estuary reported the benthic community was dominated by: nematode and oligochaete worms, harpacticoid copepods, amphipods and aquatic insect larvae (Kistritz Consultants Ltd., 2001). A study by G.L. Williams & Associates Ltd. (1995) classified the shoreline in the Project vicinity as “Low Productivity Habitat.”

Coho

Coho salmon emerge from the gravels and can stay in stream or estuary systems for two years before heading out to sea. Coho may use the Site frequently coming and going from the Bear River or traversing from the Bear River to the estuary to the west. They may be present all year long.

Sockeye

Sockeye are found in the Bear River. They tend to migrate to sea later than chum but do not stay around as long as Coho. They may use the site to come and go from the Bear River and head to the estuary to the west.

Chinook

Chinook may use the Bear River. They tend to migrate to sea later than chum but do not stay around as long as Coho. They may use the site to come and go from the Bear River and head to the estuary to the west.

Chum

Chum emerge from the gravels and head directly to sea. They may pass by the site briefly before heading to the deep ocean. They are unlikely to be at the site for any length of time.

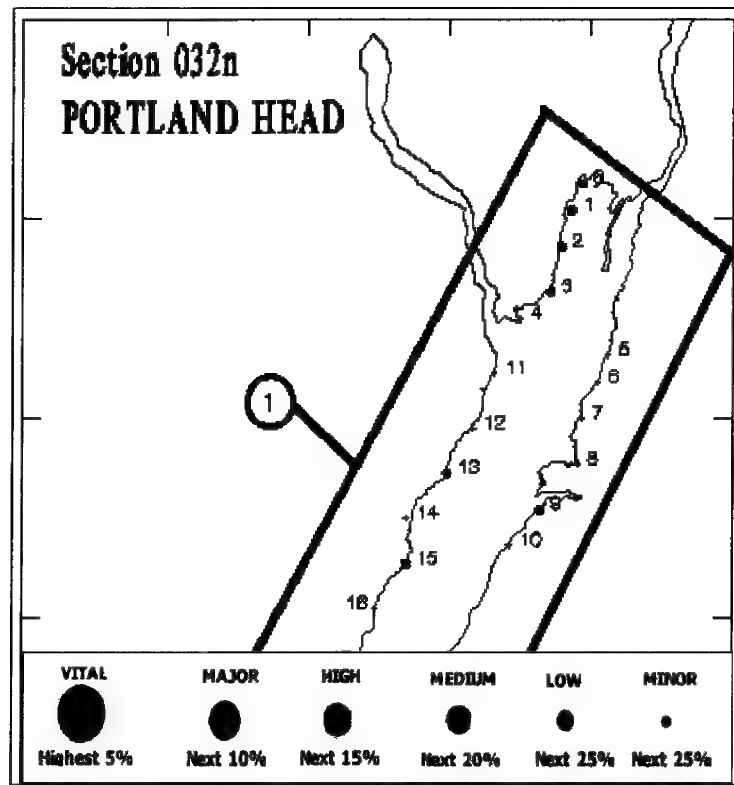
Pink

Pink are not known to use the Bear River but may visit the estuary briefly while exiting the nearby Salmon River. Pink salmon return to the ocean quickly after emerging from river gravels and head seaward. Pink salmon are not likely to use the Site.

Pacific Herring

Pacific Herring (*Clupea pallasii*) spawning was recorded at the head of Portland Canal in the late 1950s to mid-70s (survey period 1928 to 2001; Hay and McCarter, 2015). Sites were classified as "minor" habitat value (Figure 5).

Area 3 is closed to the harvest of all bivalve shellfish due to the high risk of Paralytic Shellfish Poisoning (PSP, red tide) and Domoic Acid Poisoning (also known as Amnesic Shellfish Poisoning; ASP) contamination. There are no shellfish or finfish aquaculture operations in Portland Canal.



Note: Taken from Hay and McCarter (2015)

Figure 5 Pacific Herring Spawn Records in the Project Area

3.1.5 Marine Mammals

There are various marine mammals that might be encountered in the area, harbour seals (*Phoca vitulina*), killer whales (*Orcinus orca*), Steller's sea lions (*Eumetopias jubatus*), harbour porpoise (*Phocoena phocoena*), Pacific white-sided dolphin (*Lagenorhynchus obliquidens*) and river otters (*Lutra canadensis*) are the most likely mammals to be encountered as they are year-round residents and are known to use estuarine environments.

Only killer whales, steller's sea lions, and harbour porpoises are established Species at Risk. Grey (*Eschrichtius robustus*) and humpback whales (*Megaptera novaeangliae*) are found in the region and are known to inhabit estuaries, however, during the winter they migrate south to warmer waters, and will therefore not be in the area during the project works. The sea otter (*Enhydra lutris*) is a protected species, however, they have a very limited distribution and are not known to be near the project site, furthermore their preferred habitat is not found within the project footprint.

Most of these species are typically observed in waters much deeper than the project footprint and are primarily found in open water. None of these species were observed during the onsite biophysical survey and are not expected to be at the site during construction.

3.1.6 Other Wildlife

The Project area is part of the Coastal Western Hemlock biogeoclimatic zone, wet maritime (CWHwm); vegetation is characterized by mature temperate rainforests dominated by western hemlock (*Tsuga heterophylla*) and amabilis fir (*Abies amabilis*), with a sparse herb layer and predominance of several moss species (Meidinger and Pojar, 1991). The Project Site is entirely aquatic and unvegetated; no impact to the riparian area is anticipated.

The estuary may provide habitat for wildlife use. Foraging habitat for small marsh-associated passerines, shorebirds, dabbling ducks, geese, swans, and some small aquatic animals, such as the river otter (*Lontra canadensis*), is available within the low vegetation and substrate of mudflats, and in the brackish shallow waters at low tide. These areas also provide opportunities for loafing/resting shorebirds and waterfowl.

Black bears (*Ursus americanus*) are common in the Project area. Bald eagle (*Haliaeetus leucocephalus*) populations have been reported as prevalent during salmon spawning periods (Cambria Gordon Ltd. 2006). The area is not documented as an area of "Relative Importance" for birds or marine mammals (CRIMS, undated). There are no identified "Important Bird Areas" in the Project's vicinity (IBA, 2016).

3.1.7 Species at Risk

Table 4 presents a summary of listed species which have been documented within 5 km of Project area or have the potential to occur within suitable habitats (CDC, 2016). Plants were excluded as no impact to riparian vegetation is anticipated.

Table 4 Species at Risk with Potential to Occur in the Project Area (CDC, 2016)

Common Name	Scientific Name	BC List ³	SARA ⁴ Schedule 1	COSEWIC ⁴
Fish				
Eulachon	<i>Thaleichthys pacificus</i>	Blue	-	SC (May 2013)
Green sturgeon	<i>Acipenser medirostris</i>	Red	1-SC (Aug 2006)	SC (Nov 2013)
Herptiles				
Western toad	<i>Anaxyrus boreas</i>	Yellow	1-SC (Jan 2005)	SC (Nov 2012)
Avian				
Great blue heron fannini subspecies	<i>Ardea herodias fannini</i>	Blue	1-SC (Feb 2010)	SC (Mar 2008)

Common Name	Scientific Name	BC List ³	SARA ⁴ Schedule 1	COSEWIC ⁴
Marbled murrelet	<i>Brachyramphus marmoratus</i>	Blue	1-T (Jun 2003)	T (May 2012)
Peregrine falcon pealei subspecies	<i>Falco peregrinus pealei</i>	Blue	1-SC (Jun 2003)	SC (Apr 2007)
Short-eared owl	<i>Asio flammeus</i>	Blue	1-SC (Jul 2012)	SC (Mar 2008)
Mammals				
Grizzly bear	<i>Ursus arctos</i>	Blue	-	SC (May 2002)
Northern myotis	<i>Myotis septentrionalis</i>	Blue	1-E (Dec 2014)	E (Nov 2013)
Steller sea lion	<i>Eumetopias jubatus</i>	Blue	1-SC (Jul 2005)	SC (Nov 2013)
Wolverine luscus subspecies	<i>Gulo gulo luscus</i>	Blue	-	SC (May 2014)

³ Blue: indigenous species considered of Special Concern in BC and which are particularly sensitive or vulnerable to human activities or natural events. Red: indigenous species considered Endangered or Threatened (definitions as below).

⁴ NAR: Not at Risk. SC: Special Concern – A species whose characteristics make it particularly sensitive to human activities or natural events. T: Threatened – Likely to become endangered if limiting factors are not reversed. E: Endangered – Facing imminent extirpation or extinction.

Eulachon have been designated as Blue-listed provincially and species of “Special Concern” by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2013A). Eulachon is a migratory species; they may use the estuary habitat during their migration to the freshwater reaches of the Bear River (in late winter and/or early spring) and possibly for rearing (in the spring). It is unlikely that returning adults and outmigrating larvae would be impacted by the Project if construction is scheduled within the prescribed window (i.e., November 30 to February 15).

Green sturgeon (*Acipenser medirostris*) is a provincially Red-listed species and classified as “Special Concern” under the *Species at Risk Act* (SARA). Green sturgeons are generally encountered in marine and estuarine environment, but little is known about the species’ habitat requirements (COSEWIC, 2004). They are anadromous fish but have been rarely encountered in freshwater. They have been found in brackish waters at the mouth of large rivers, and adults and sub-adults have been found aggregating in non-natal estuaries of coastal bays. There are no known spawning populations in BC (COSEWIC, 2004). It is unlikely green sturgeons inhabit the Project area (due to shallow depths) and therefore, it is not anticipated this species will be impacted by the Project activities.

Western toads (*Anaxyrus boreas*) are provincially yellow listed and classified as “Special Concern” under SARA. This species uses a wide variety of habitat types including estuarine habitat types (COSEWIC, 2012). Western toads aggregate in spring time to reproduce making use of ponds, and edges of lakes. Tadpoles undergo metamorphosis and transition to using the ecotones between terrestrial and aquatic areas (COSEWIC, 2012). They are not found in the marine environment, and therefore are not likely to be present at the Site.

Great blue herons (*Ardea Herodias*) were observed foraging in the vicinity of the Project Site, during the 2015 survey. This species (*fannini* subspecies) is provincially Blue listed and a species of Special Concern under Schedule 1 of the federal SARA. Herons seasonally forage for frogs and small mammals in estuaries, wetlands and grassy fields. Herons are most likely to forage and rest at the water's edge in the estuary to the west of the Project Site, where there is the least human disturbance.

Marbled murrelet (*Brachyramphus marmoratus*) are provincially Blue-listed. Marbled Murrelets are also classified “Threatened” under SARA. They are known to forage primarily in protected waters where their main prey (i.e., Sand Lance [*Ammodytes*] and Surf Smelt [*Hypomesus pretiosus*]) are readily available; they also require old-growth forest for nesting.

Peregrine falcons (*Falco peregrinus pealei*) are provincially blue listed and registered as “Special Concern” under SARA. Peregrine falcons use a variety of habitat types to forage, pending they are in close proximity to suitable nesting locations. These sites usually consist of steep cliffs or structures with considerable elevation (COSEWIC, 2007).

Short-eared owls (*Asio flammeus*) are provincially blue listed and registered as “Special concern” under SARA. The species has been declining since the 1980's due to speculated disturbance and habitat loss in their winter breeding habitat (COSEWIC, 2008). However, the species has been documented to use coastal marsh habitat for foraging (COSEWIC, 2008).

Grizzly bears (*U. arctos*) are Blue-listed provincially and a species of “Special Concern” under COSEWIC. Grizzlies may use estuarine habitat and the river banks for foraging – especially during salmon spawning migrations – however they will generally stay away from inhabited areas.

The northern myotis (*Myotis septentrionalis*) is blue listed provincially and registered as “Endangered” under SARA. The species uses hibernacula to overwinter throughout BC. This species is an insectivore that forages in gaps present in forested habitat (COSEWIC, 2013B). and is therefore unlikely to be present at the Site.

Steller sea lions (*Eumetopias jubatus*) are provincially Blue-listed of “Special Concern” under SARA (CDC, 2015). Steller sea lions may use the estuary for foraging, especially during Pacific Salmon spawning. It is unlikely Steller Sea Lions inhabit the Project area, with the exception perhaps of Pacific salmon spawning migration periods.

Wolverines (*Gulo gulo luscus*) are provincially blue listed and registered as Special Concern under SARA. They are the largest member of the weasel family in North America (COSEWIC, 2003). This species uses a wide variety of habitat types including forests and tundra (COSEWIC, 2003). While they could forage on the foreshore, they existing port activities would discourage them from using the Site and are therefore unlikely to be present.

3.2 Biophysical Conditions at the Project Site

A biophysical survey of an area that includes the proposed Project Site was conducted by Balanced Environmental in May 2012, in support of an environmental assessment for the barge ramp relocation project (Balanced Environmental, 2012). The area's elevation is approximately 2.0 m above chart datum (CD) and substrate is dominated by gravel (originating from the Bear River Watershed), with areas of sand, some cobble and limited woody debris (see Balanced Environmental report; drawing 5397-D-02.2 with associated photos). Five old wooden dolphins are located east of the groyne.

The area was sparsely colonized, likely due to the polyhaline conditions (i.e., resulting from the Bear River influence) and lack of habitat complexity. Rockweed (*Fucus gardneri*) and cornrow sea lettuce (*Ulva intestinalis*) were among the only observed macroalgae in the area; both species were found mainly on riprap substrate. Rockweed was documented at elevations between 4.4 and 2.3 m above CD. Cornrow sea lettuce is often associated with freshwater influence (Lamb and Hanby, 2005). Unidentified green algae and what was identified as colonial diatoms were also observed over less than 25% of the surveyed gravel substrate. The green alga was also the only organism documented on the dolphins. A survey conducted in September 2015 (to document post-construction conditions at the SWP) found evidence of distinct water conditions on each side of the newly-built causeway, based on the observed Rockweed distribution along the riprap (Keystone Environmental Ltd. 2016). While Rockweed was present on the west side of the causeway, none was seen on the east side (i.e., river side). Although several factors may have contributed to this distribution, a difference in salinity (resulting from the physical barrier created by causeway, which may be limiting the mixing of freshwater and seawater) is suspected to be the main cause.

Intertidal fauna observed during the 2012 surveys was limited to common acorn barnacles (*Balanus glandula*) and unidentified shrimps (Balanced Environmental, 2012). A few tanner crabs (*Chionoecetes bairdi*) were also documented in the intertidal, with greater abundance in the subtidal area. No clams were present. No fish were reported but fish identified during the desktop review are known to use the area during high tide. A summary of biophysical conditions is shown in Table 5.

Table 5 Biophysical Conditions Summary

Name	Elevation Range (m CD)	Physical Conditions	Observed Biota	Fish Usage Examples	Area of Project Footprint (m ²)
Intertidal gravel	1.0 – 3.0	Pebble dominant, cobble, sand and silt less common, shallow slope, wave exposed, low salinity	Sparse crabs, shrimp	Fall up-migration: coho, chum, sockeye, maybe chinook or pink Overwintering: coho, sticklebacks Spring up-migration: eulachon Spring out-migration: coho, chum, sockeye, eulachon Summer Rearing: coho	6,123
Intertidal riprap	2.0 – 7.6	Riprap, steep slope, wave exposed, lowest salinity on Bear River side	Sparse rockweed, green sea lettuce, barnacles	Spring spawning: Low potential for herring spawn on lower elevation rock with rockweed.	1,522
Total					7,645

4. ASSESSMENT OF POTENTIAL ENVIRONMENTAL EFFECTS

Potential impacts of Project activities to fish species that are part of a commercial, recreational or Aboriginal fishery, to fishes that support such a fishery, and to at-risk fish species were assessed, along with impacts to aquatic habitat (including water and sediment quality). Pathways of Effects (DFO, 2010) were also considered, where applicable.

4.1 Potential Project Effects on the Aquatic Environment

The following potential impacts to the aquatic environment may occur as a result of the SWP Project activities.

4.1.1 Water Flow

Impact on flow due to the placement of structures in water was assessed by Northwest Hydraulic Consultants as part of MFLNRORD File No. 6408762 Licence of Occupation. Preliminary indications of the analysis suggest that there will be marginal to no impacts from the Project structure (SWP, 2016).

The proposed avalanche shield will redirect flow from the Bear River that would have escaped to the west. It will force the water to discharge 275 m further to the south. While the structure is permanent, at an advancement of 11 m per year, effects of this change on the seaward deposition pattern south of the avalanche shield will return to equilibrium sooner than 25 years (275 m / 11 m per year). Therefore changes to water flow are temporary in the larger time scale.

The impacts are discussed in the 17-HPAC-00206 Request for Additional Information report by Keystone Environmental (2017). In summary, Keystone Environmental found no significant change to the deposition in the estuary, and minimal changes upriver of the avalanche shield. Substrates (primarily sand, pebble, and cobble) that currently accumulate in the area of the avalanche shield would create an alluvial fan from the southern tip of the avalanche shield and continue deposition similar to the current conditions approximately 275 m south of the current southern tip of the causeway. In addition, erosion immediately adjacent to the proposed avalanche shield is expected to create a low-flow channel along the base of the avalanche shield and continue upstream along the causeway.

4.1.2 Water and Sediment Quality

Water and sediment quality at the Project Site and adjacent areas may be affected through:

- Introduction of deleterious substances (e.g., polycyclic aromatic hydrocarbons; PAHs) to the Bear River Estuary and Portland Canal, due to accidental release from on-site heavy machinery (DFO, 2010), during the construction works and the operational activities could negatively impact aquatic species at the Project Site and in adjacent areas.
- Temporary increase in suspended sediments from construction works (i.e., infilling) could negatively impact aquatic species at the Project Site and in the vicinity.

- Erosion/sedimentation events from upland construction activities, resulting in decreased water quality, which could negatively impact aquatic species at the Project Site and downstream.
- Reduction in the deposition of pebble and cobble substrates to west of the proposed avalanche shield (Keystone Environmental, 2017), which would otherwise require dredging to maintain navigation depths at the terminal. This would be in the order of 49,000 m³ per year.
- Contamination of water and/or sediment via leaching from infilling materials.
- The change in total suspended solids in the estuary to the west is expected to be negligible on the projects time scale. Total deposition in the estuary is estimated to be only a few mm per year.

4.1.3 Noise

Underwater and air noise generated during Project activities may affect fish and other wildlife through:

- Temporary disturbance of aquatic wildlife, such as seals and river otter. Pile driving is not required, therefore noise generated from excavators and dump trucks, and placement of rock, is unlikely to result in significant residual effects.

4.1.4 Direct Loss of Habitat and Impact to Fish

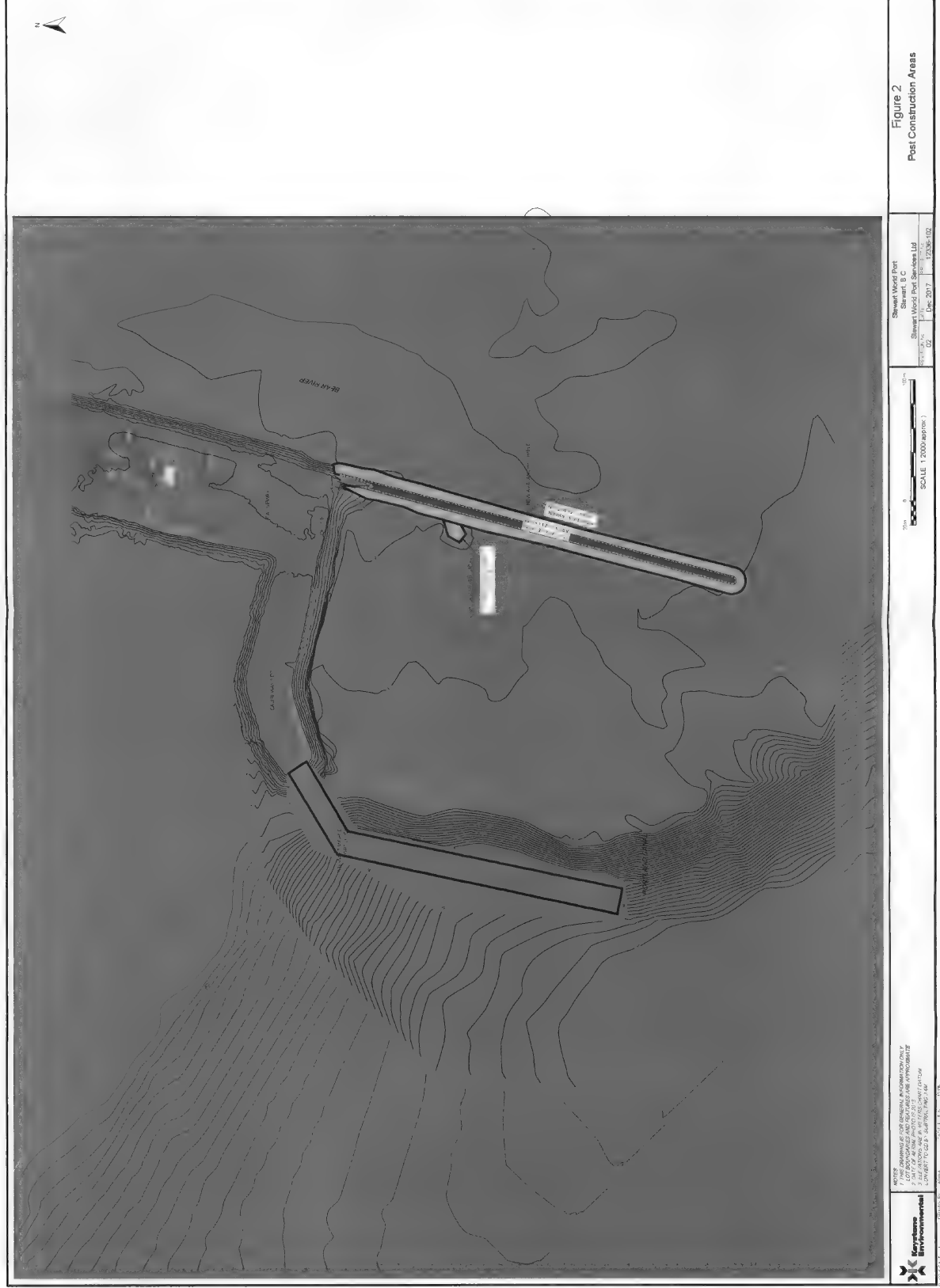
"Serious harm to fish" is defined in Subsection 2(2) of the *Fisheries Act* and means "the death of fish or any permanent alteration to, or destruction of, fish habitat." Project activities and associated potential effects which could result in serious harm to fish are:

- The introduction of deleterious substances in the water, either through a pulse event (such as a spill) or gradual contamination (such as leaching of contaminants in fill materials), could result in fish kill (in the immediate vicinity) and/or reduction of productive capacity as a result of habitat destruction;
- Infilling of a portion of the Bear River alluvial fan will cause direct loss in productive capacity at the Site. However, since the area to be filled has been characterized as *marginal value fish habitat*, the potential loss in productivity suspected will be limited in nature. No spawning areas are present for eulachon at the site. Productive sources of food for fish and invertebrates are not present. Productive fish habitat is not present. The primary loss of function is related to the loss of water column itself (i.e. used by fish), and the further loss of connectivity between the Bear River and the estuary to the west for fish (fish have to swim around end of avalanche shield). This has a greater effect on fish that use both the river and estuary (e.g., coho, sockeye) compared to fish that head directly to sea (e.g., chum).

Direct loss of habitat and impacts to fish may occur as a result of Project activities through:

- Within the footprint of the avalanche shield, and below the HWM of 7.6m CD, there are two types of existing habitat present. There are the intertidal gravel substrates, which are unconsolidated, lack productive algae, are unstable and are not used for spawning. There is also intertidal riprap that was placed during previous emergency authorization works in July of 2016. The riprap is still fairly new and is not colonized by algae or invertebrates. A small portion of the riprap sticks out beyond the avalanche shield footprint i.e. the "hook." This will be removed so that gravel substrate can be produced (to reduce the net loss of gravel substrate).
- The areas below the HWM covered over by the avalanche shield are shown in Figure 6. The area of intertidal gravel covered is $202 \text{ m}^2 + 5,921 \text{ m}^2 = 6,123 \text{ m}^2$. These areas are converted to intertidal unvegetated riprap or riprap above the HWM. The area of existing unvegetated riprap below the HWM that will be covered over is $1,330 \text{ m}^2$. This area will be converted to riprap at a higher elevation. The "hook" (see Figure 6) that extends beyond the project footprint will also be removed in order to convert this area back to gravel substrate (192 m^2). The total area where works will occur below the HWM is therefore $6,123 \text{ m}^2 + 1,330 \text{ m}^2 + 192 \text{ m}^2 = 7,645 \text{ m}^2$.
- The areas that are within the project footprint post-construction will consist of riprap in the intertidal and riprap above the HWM. These areas are shown in Figure 7. The area of riprap below the HWM after the project is completed is $5,640 \text{ m}^2$. The area of riprap above the HWM is $1,813 \text{ m}^2$. As mentioned above, beyond the project footprint a 192 m^2 area of gravel will be created from removal of riprap from the "hook". The total area again adds to $7,645 \text{ m}^2$.
- The residual loss of habitat function for fish associated with the project is calculated by determining the net loss of each habitat type. The proposed works will result in a net increase in intertidal riprap habitat of $4,118 \text{ m}^2$, and, a net increase in area above the HWM of $1,813 \text{ m}^2$. However, the net residual loss of habitat that results from this project is a loss of intertidal gravel habitat. **The net residual loss is $-5,931 \text{ m}^2$** ($192 \text{ m}^2 - 202 \text{ m}^2 - 5,921 \text{ m}^2$). The residual loss is permanent and will require habitat offsetting to replace the lost function associated with this habitat type (e.g., loss of benthic invertebrate worms and insect larvae; effects to fish migration / access to and from the Bear River, and loss of water column).
- Because the project involves the placement of rock below the HWM, there will be a permanent loss of water column. The volume of water displaced by the project is approximately $25,000 \text{ m}^3$.
- The distance that juvenile fish have to travel from the mouth of the Bear River to the estuary to the west of the site will permanently increase because the avalanche shield will push the entrance to the river further south. Juvenile fish (e.g. salmon and eulachon) will have to travel an additional 375 m (at high tide) before reaching the estuary west of the Project. They may have to expend additional energy or may be eaten by other wildlife during that time.





Other effects that were considered include the effects of the changes of the project on the deposition pattern on the seabed of Bear River alluvial fan below the Low Water Mark (LWM). Using an analysis of the rate of advancement of the estuary, it has been estimated that there may be a temporary loss of 70 m² of subtidal silt habitat deeper than -30 m CD due to the overall increased depth that the alluvial material that will be deposited (Keystone Environmental, 2017) (NHC, 2016). This change is temporary as the Bear River alluvial fan is expected to return to the current deposition pattern but further seaward in less than 25 years at this rate once it pushes past the avalanche shield.

Effects of the project on the river itself were considered. The hydraulic engineers have concluded that installation of the avalanche shield may result in some local erosion at the toe of the avalanche shield, but did not identify any additional flooding or backing up of sediment upstream of the site that may result from the proposed work. The avalanche shield is proposed to be installed in a north/south direction parallel with the river itself. This prevents pinch points, preventing additional accumulation of sediment in the river.

Effects on the deposition in the estuary to the west were also evaluated. The current deposition rate was estimated to be only a few mm per year. Changes to the current deposition rate were expected to be negligible, as the total suspended solids in the water column at the estuary is not expected to change with the addition of the avalanche shield. Therefore, no changes to the estuary marsh or consolidated intertidal mudflat are anticipated.

Overall, the residual harm to fish is described through a permanent loss of -5,931 m² of intertidal gravel habitat. The loss of habitat function will require habitat offsetting in addition to mitigation measures provided in this assessment.

4.1.5 Impacts to Species at Risk

The majority of species at risk found in the Stewart area do not use the Site and therefore will not be affected. Critical spawning habitat is not present at the Site, however, species like eulachon are known to pass through the Site on their way to the Bear River.

Eulachon return to the Bear River to spawn upstream after February 15. Works that are conducted prior to February 15 should have little impact to eulachon during the construction phase. During the long term operation of the Port, eulachon can still swim directly into the Bear River upon their return from the ocean and therefore should be unaffected by the avalanche shield if they were present.

Stellar sea lions tend to follow the salmon runs, and may be present in the water column in the fall. The construction or operational phase of the project is unlikely to affect Stellar sea lions as the majority of their time will be spent away from the Site, works will be conducted in the dry, and works will be conducted behind a silt curtain.

4.1.6 Impacts to Other Marine Mammals

As works will be conducted in the dry, no potential effects are anticipated for cetacean species with the possibility to occur in the marine area. Works are not expected to generate underwater noise in excess of 160 dB nor pressure waves in excess of 30 kPa, which can be damaging to cetaceans. Pinniped (e.g., sea lions) and/ or marine fissiped (e.g., sea otters) species may be affected by temporary noise from machinery, causing them to avoid the Site.

4.1.7 Cumulative Impacts

The operation of the SWP facility is based on supply and demand – it is not known if the existing infrastructure will have sufficient laydown space to keep up with demand. However, the amount of information being requested in order to obtain project approvals is no longer economically viable to pursue further, therefore SWP has cancelled efforts to conduct dredging in the Bear River, and expand the port facility. Removal of vegetation to create laydown areas upriver, and installation of a launching ramp facility have also been cancelled.

It is not known if these activities will be conducted by others (i.e., District of Stewart) or not because the District has financial limitations and a small tax base. Eventually the Bear River will accumulate sediment and flood the town if it is left unattended. SWP will use material sourced from other locations, therefore there is no longer a link between the dredging works and SWP.

The Bear River will continue to infill the Portland Canal. In 25 years, the alluvial fan may be as far south as the length of the avalanche shield. It is not known if additional groynes will be required to further direct flow seaward at that time in order to keep the Port operational.

If the groynes are not constructed properly, there could be accumulation of sediment in the SWP boat basin. This could require dredging in the future if vessel clearances are not adequate for the size of ships using the Port facility.

In the future, if additional demand for Port resources is required by Canadian or foreign markets, additional laydown areas or docks may be needed to keep up with demand. These are currently unknown.

4.2 Mitigation Measures

Prevention measures for Project potential environmental effects were considered prior to the development of mitigation strategies. Where effect avoidance was not possible or practical, mitigation measures and best management practices were identified for each of the Project's potential effects.

A qualified Environmental Monitor (EM) will be present at the Site full time during all in-water construction activities (detail in Appendix 2). The EM will be responsible for communicating the mitigation measures and best management practices to implement by the construction crew, and for ensuring developed objectives and standards of the Environmental Monitoring Plan are achieved. Where possible, practices described in *A Users' Guide to Working In and Around Water* (MOE, 2005) and *Standards and Best Management Practices for Instream Works*

(SBPISW; MOE, 2004) will be applied. Measures proposed to mitigate potential Project effects on fish and fish habitat are listed below. The EM will be empowered in writing to shut down works if DFO requirements are not being met (i.e. conditions of the *Fisheries Act* Authorization or supporting documents including this Aquatic Effects Assessment).

Although swim distance will be increased for species required to swim around the end of the shield to enter the estuary, recent fish compensation works by SWP have made permanent fish passage accessible further upstream.

4.2.1 Work Window

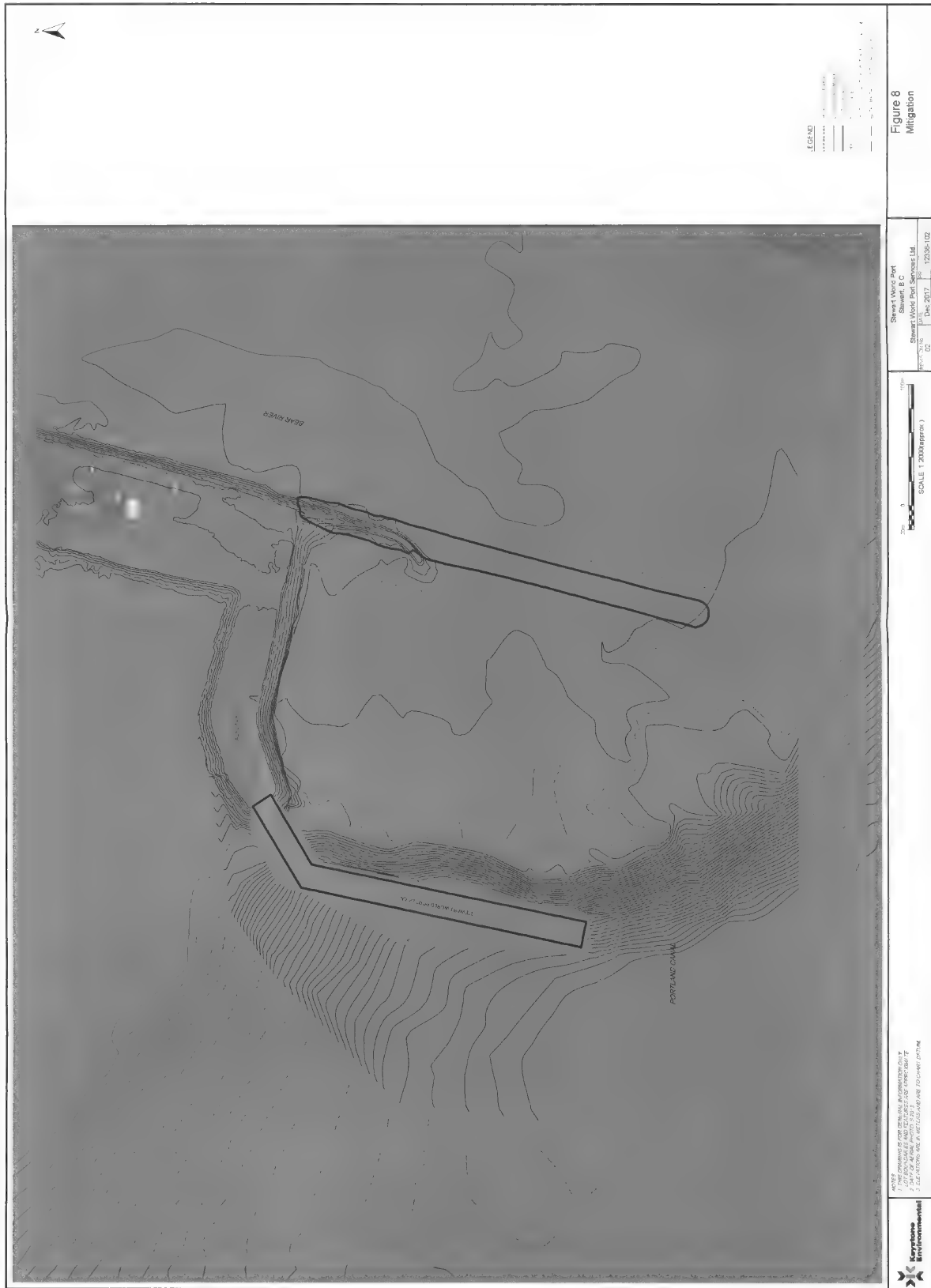
The Project is scheduled to occur during the marine/estuary fisheries window of least risk for the Area 3 – Lower Nass (which also includes Portland Canal), **November 30 to February 15** (DFO, 2014b).

4.2.2 Water and Sediment Quality

The following measures will be implemented to mitigate potential Project effects to water and sediment quality:

- All materials used for infilling will be sourced from an approved upland distributor. No excavation of sediments will occur.
- All materials to be used in and around water, including selected fill materials, will be certified clean (i.e., they will not present any risk of leaching contaminants or affecting water/sediment chemistry). Only non-acid generating rock will be used. The EM will test require proof prior to the use of material that imported material is clean and non-acid generating rock.
- Infill materials placed below the HWM will not contain any fines and shall be inspected by the EM prior to use on the Site.
- Compaction of rock below the HWM will be conducted by driving over the material (e.g., with equipment such as a dump truck or excavator).
- Equipment (e.g., heavy machinery) used in and around water will be kept clean and in good working condition (i.e., free of leaks, excess oil, and grease).
- Hydraulic machinery used in water will use environmentally-friendly hydraulic fluids (i.e., non-toxic to aquatic life, and biodegradable).
- A 'Fuels, Chemicals and Materials Storage and Handling Plan' will be developed, in compliance to Ministry guidelines (Ministry of Water, Land and Air Protection; MWLAP, 2002) if fuels will be stored at the Site.
- Equipment washing, refueling and servicing will be conducted 30 m from the HWM.
- A spill containment kit will be accessible onsite and a Spill Response Plan will be developed and communicated to the construction crew by the contractor. If a spill occurs immediate corrective measures will be taken.

- A silt fence will be installed along the top of the slope of the causeway along the river side (Figure 8) to prevent any migration of suspended sediment into the Bear River from trucks. It will be inspected at the beginning of each day by the EM.
- A full height isolation barrier (e.g., silt curtain) will be installed to isolate the Project from adjacent areas (Silt Curtain; Figure 8). Requirements for the isolation barrier are as follows:
 - The isolation barrier must be anchored to the seabed, and the full height of the water column at high tide.
 - The barrier will be designed to fully enclose the proposed avalanche shield areas, which will include anchorage to the shoreline (above the HWM).
 - The isolation barrier will be designed in such a way that it is functional for construction purposes to proceed with low probability of malfunction. It is expected to be a log boom with filter fabric attached around the log boom and hanging full height (e.g., 5.6 m tall) with the bottom weighed down with cable or chain.
 - The isolation barrier will be maintained and repaired by the contractor to maintain water quality values described below. The integrity of the isolation barrier will be monitored for deficiencies by the contractor and EM daily.
 - Water quality (turbidity [NTU] and Total Suspended Solids [TSS]) will be checked by the EM at the stations shown on Figure 8 during infilling activities. Water quality standards for the protection of aquatic life will conform to the criteria detailed below. A TSS to NTU conversion curve will be created prior to works by the EM by collecting samples of sediment (gravel) at the site, mixing it with water to create three different turbidities, and having them analyzed by a certified lab, and comparing those results to the turbidity of each sample. High flows will be defined, for this project, as the flowing Bear River, while low flow will be tidal flow only.
- Water quality criteria will be checked at the monitoring stations (Figure 8) by the EM at minimum every two hours during construction, and after working hours no later than two hours after the tide inundates intertidal areas worked on in the dry. The collection of *in situ* water quality samples are detailed in Appendix 2. Water quality will conform to the BC Water Quality Guidelines outlined in Table 6.
 - Automatic shutdown compliance stations will be established 100 m from the silt curtain as shown in Figure 8 and 9 (this is the procedure that was conducted on the Esquimalt Graving Dock project by the Federal Government). If measurements do not meet compliance at 100 m from the edge of the isolation barrier works will cease immediately and additional mitigation measures and/or repair of the isolation barrier will occur, or time will be allowed to pass until water quality is compliant again. Samples are to be collected at the surface, mid water column and at the seabed.
 - Warning stations will be setup at 25 m from the silt curtain. If measurements at these stations exceed water quality criteria in Table 6, the contractor will be warned and further monitoring will be conducted every half an hour for two hours. If after two hours the water quality still is not compliant, the works will be shut down until water quality is compliant with Table 6. Samples are to be collected at the surface, mid water column and at the seabed.
 - Background water quality samples to be collected upstream/up current from the works on a daily basis.



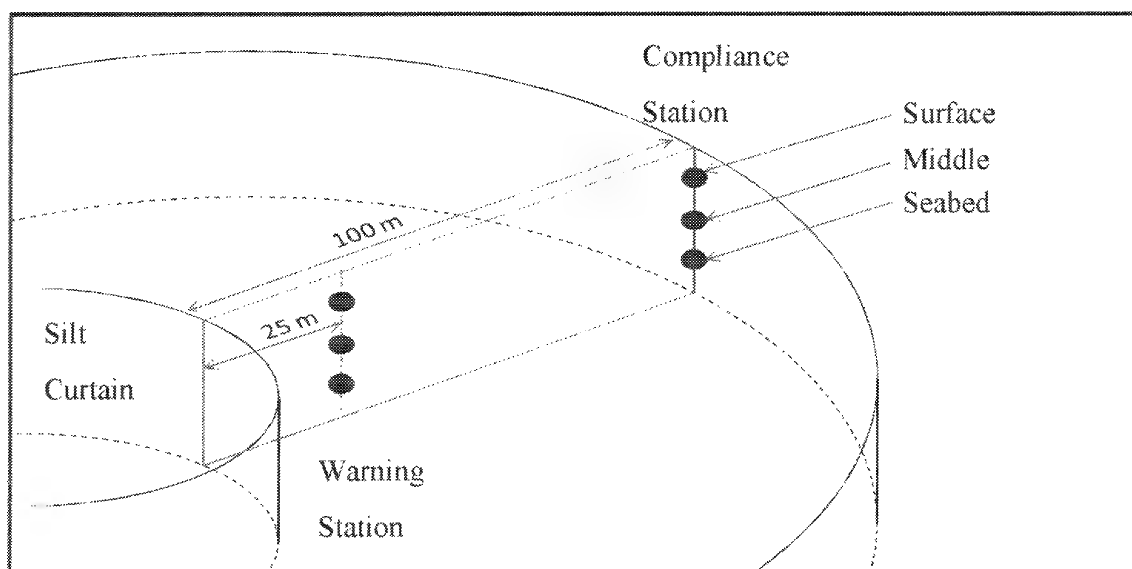


Figure 9 Warning and Compliance Water Quality Station Locations relative to Silt Curtain

Table 6 Water Quality Criteria for Turbidity and Suspended Sediments (MOE, 2017)

Water Use	Turbidity	Non-filterable Residue (Total Suspended Solids)
Protection of Aquatic Life (Fresh, Marine, Estuarine)	<ul style="list-style-type: none"> Change from background of 8 NTU at any one time for a duration of 24 h in all waters during clear flows or in clear waters Change from background of 2 NTU at any one time for a duration of 30 d in all waters during clear flows or in clear waters Change from background of 5 NTU at any time when background is 8–50 NTU during high flows or in turbid waters Change from background of 10% when background is > 50 NTU at any time during high flows or in turbid waters 	<ul style="list-style-type: none"> Change from background of 25 mg/L at any one time for a duration of 24 h in all waters during clear flows or in clear waters Change from background of 5 mg/L at any one time for a duration of 30 d in all waters during clear flows or in clear waters Change from background of 10 mg/L at any time when background is 2–100 mg/L during high flows or in turbid waters Change from background of 10% when background is > 100 mg/L at any time during high flows or in turbid waters

4.2.3 Noise

The following measures will be implemented to mitigate potential Project effects resulting from noise:

- A 500 m cetacean safety zone and 25 m pinniped safety zone will be established from any areas where in-water works are occurring. If any marine mammals are sighted within their respective zones, the EM will call for works to cease until they have moved outside the safety zone or are not sighted for 30 minutes.
- A discretionary 500 m cetacean safety zone and 25 m pinniped safety zone will be established from the most southern point of the silt curtain. The EM will monitor both and use the difference between the safety zone and discretionary safety zones as a warning area to work crews. Works will continue until marine mammals are observed in the safety zones if in-water works are occurring.

No residual effects are expected after mitigation measures are applied. No pile driving or other activities that generate loud underwater vibrations will occur.

4.2.4 Direct Loss of Habitat and Impact to Fish

The following measures will be implemented to mitigate potential direct loss of habitat and impact to fish:

- The infilling footprint will be clearly delineated, and the EM will stop works should they be observed outside the marked area.
- Where practicable, works will occur in the dry at low tide to eliminate direct harm (e.g., crushing) of fish.
- An isolation barrier i.e. full height silt curtain (Figure 8) will be deployed around the Project footprint to restrict potential spread of suspended sediment as water levels rise over the works site during flood tides.
- Silt fence will be installed along top of slope of the causeway to reduce turbid water run-off from site (Figure 8).
- Any observed fish kill or evidence of injuries to fish will result in an immediate shut down of works and will be immediately reported to Fisheries and Oceans Canada, the client, and the contractor.
- In-water works will occur within the prescribed window (i.e., between November 30 to February 15; DFO, 2014b).

4.2.5 Species at Risk

The following measures will be implemented to mitigate potential impact to species at risk:

- Where practicable, works will occur in the dry at low tides to eliminate direct interface with eulachon and Steller sea lions.

- Works will occur within the least risk window of November 30 and February 15 to reduce risk to in-migrating eulachon.
- Execute the eulachon monitoring plan (Appendix 7).
- If there is direct (sighting) or indirect (increased bird or marine mammal presence) indication suggesting presence of eulachon, the EM will stop works and the supervising professional biologist (R.P.Bio) will be consulted to determine if works can continue. The professional biologist will suggest additional mitigation measures when suitable.

4.2.6 Marine Mammals

The following measures will be implemented to mitigate potential impact to marine mammals:

- Where practicable, works will occur in the dry to eliminate risks to cetacean species, and to reduce risk to pinniped species.
- If any marine mammals are sighted within the 500 m or 25 m safety zone, the EM will call for works to cease until they have moved away (see Appendix 6).

4.2.7 Climate Change

The following measures will be implemented to mitigate potential impacts of climate change:

- Where practicable, vehicles and machinery will restrict idling to reduce the amount of exhaust generated.
- Equipment and vehicles will have functional exhaust systems and air filters to reduce particulate emissions.

4.3 Residual Harm to Fish

A summary of the project areas before and after construction are summarized in Table 7 below (i.e., the residual harm to fish).

Table 7 Habitat Balance Sheet

Description	Pre-Construction (m ²)	Post-Construction (m ²)	Net Area (m ²)	Offsetting Ratio	Offset Area Required (m ²)
Intertidal gravel	6,123	192	-5,931	1:3	1,977
Intertidal riprap	1,522	5,640	4,118	No Credit	0
Fill above the HWM	0	1,813	1,813	No Credit	0
Total	7,645	7,645	0	n/a	1,977

Based on Table 7, SWP will have to construct 1,977 m² of habitat offsetting (using an agreed upon 1:3 habitat ratio from previous SWP projects at the site) in order to offset residual impacts associated with the conversion of intertidal gravel habitat to intertidal riprap or upland avalanche shield.

4.4 Conclusions

Based on the results from the desktop review and data from the 2012 surveys, the intertidal habitat that will be lost as a result of infilling has been characterized as *marginal*, representing low productivity. By following the planned construction design and proposed methods, and by implementing the BMPs and mitigation measures identified, in addition to adequate support from an EM, it is suspected the Project will have limited effect on fish and fish habitat. The loss of low productivity intertidal habitat due to infilling may be offset by the creation of high productive fish passage, foraging, and/or spawning habitat.

In our experience working in the area and on the Stewart World Port facility, we have seen the creation of high value, three dimensional fish habitat accepted to offset loss of low value habitat, at ratios up to 1:3. It is the opinion of Keystone Environmental the project should be allowed to proceed subject to DFO acceptance of a habitat offsetting plan that enhances a minimum of 1,977 m² of high functioning fish habitat.

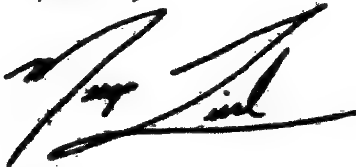
5. INTERPRETATION AND USE OF STUDY AND REPORT

This Work has been prepared for the sole use of Stewart World Port Ltd. and for review by Fisheries and Oceans Canada, pursuant to the agreement between Keystone Environmental Ltd. and Stewart World Port Ltd. A copy of the general terms and conditions associated with this agreement has been provided to Stewart World Port. This Work must be read as a whole and sections thereof cannot be read out of such context. By using this Work, Stewart World Port Ltd. and Fisheries and Oceans Canada agree to review this Work in its entirety. Keystone Environmental accepts no responsibility, and denies any liability whatsoever, to parties other than Stewart World Port Ltd., who may obtain access to this report for any injury, loss or damage suffered by such parties arising out of, reliance upon, or decisions or actions based on this report, except to the extent those parties have obtained a prior written consent of Keystone Environmental to use and rely upon this report and the information contained herein. Any use, reliance or decisions made based on this report by other parties without prior written approval by Keystone Environmental are the responsibility of such parties and Keystone Environmental accepts no responsibility for damages, if any, suffered by other parties as a result of decisions made or actions based on this Work. The findings presented herein should be considered within the context of the scope of work and project terms of reference. The findings are time sensitive and are considered valid at the time this Work was produced. The conclusions and recommendations contained in this Work are based upon applicable guidelines, regulations, and legislation existing at the time this Work was produced; consequently, any changes in the regulatory regime may alter the conclusions and/or recommendations.

December 11, 2017

Date

Prepared by:

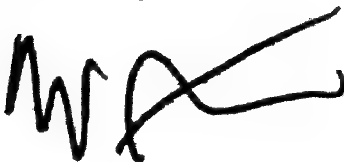


Meagan Leicht, B.Sc., B.I.T.
Biologist



Shane Byrne, M.Sc.
Biologist

Reviewed by:



Warren Appleton, R.P.Bio.
Project Manager

6. REFERENCES

- Anon. 2016 (Pers. comm.). Phone conversation regarding fish species in the Bear River Watershed and recent survey data. May 4, 2016.
- Balanced Environmental. 2012. Aquatic Effects Assessment - Barge Ramp Relocation Project, Stewart, BC. DFO # 12-HPAC-PA4-00248, Balanced # 5397-R-05.2. October 25, 2012.
- BC Government. 2016. Trade and Invest B.C. - Investments & Partnerships – Other: Bear River Gravel Investment Opportunity [undated]. Available at: <http://www.britishcolumbia.ca/invest/opportunities/investments-and-partnerships/bear-river-gravel-investment-opportunity/>, accessed: March 3, 2016.
- Cambria Gordon Ltd. 2006. Bear River Gravel Project. Revised Project Description. Prepared for Glacier aggregates Inc. Submitted to the BC Environmental Assessment Office, March 2006.
- CDC (BC Conservation Data Centre). 2016. BC Species and Ecosystems Explorer. BC Ministry of Environment. Victoria, BC Available at: <http://a100.gov.bc.ca/pub/eswp/>, accessed November 28, 2017.
- COSEWIC. 2013A. COSEWIC assessment and status report on the Eulachon, Nass/Skeena population, *Thaleichthys pacificus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 18 pp.
- COSEWIC. 2013B. COSEWIC assessment and status report on the Little Brown Myotis *Myotis lucifugus*, Northern Myotis *Myotis septentrionalis* and Tri-colored Bat *Perimyotis subflavus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxiv + 93 pp.
- COSEWIC. 2012. COSEWIC assessment and status report on the Western Toad *Anaxyrus boreas* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiv + 71 pp.
- COSEWIC. 2008. COSEWIC assessment and update status report on the Short-eared Owl *Asio flammeus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 24 pp.
- COSEWIC 2007. COSEWIC assessment and update status report on the Peregrine Falcon *Falco peregrinus* (*pealei* subspecies - *Falco peregrinus* and *pealei anatum/tundrius* - *Falco peregrinus anatum/tundrius*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 45 pp.
- COSEWIC. 2004. COSEWIC Assessment and Update Status Report on the Green Sturgeon *Acipenser medirostris* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 31 pp.

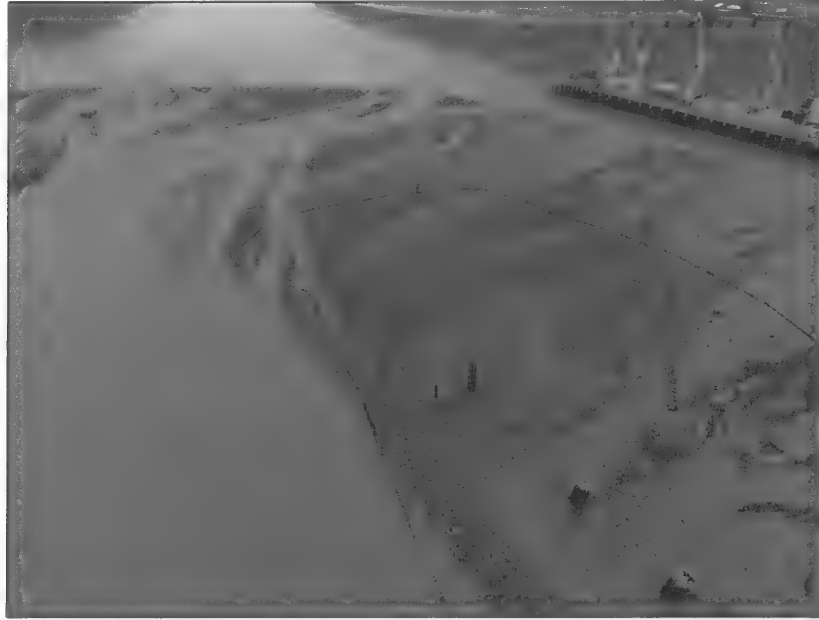
- COSEWIC 2003. COSEWIC assessment and update status report on the wolverine *Gulo gulo* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 41 pp.
- CRIMS (Coastal Resource Information System). Undated. BC Government.
- DFO (Fisheries and Oceans Canada). 2016a. Pacific Region – Fisheries Management Areas. Available at: <http://www.pac.dfo-mpo.gc.ca/fm-gp/maps-cartes/areas-secteurs/03-eng.html>, accessed: May 3, 2016.
- DFO. 2016b. Available at: <http://www.pac.dfo-mpo.gc.ca/fm-gp/rec/tidal-maree/a-s3-eng.htm#Chinook>, accessed: March 4, 2016.
- DFO. 2014a. Guidance on Submitting a Request for Review. Available at: <http://www.dfo-mpo.gc.ca/pnw-ppe/reviews-revues/index-eng.html>. Accessed: April 25, 2016.
- DFO. 2014b. British Columbia Marine/Estuarine Timing Windows for the Protection of Fish and Fish Habitat Area 3 – Lower Nass. Available at: <http://www.dfo-mpo.gc.ca/pnw-ppe/timing-periodes/bc-n-eng.html#area-3>, accessed: April 28, 2016.
- DFO. 2013. Commercial Fishing Areas. Available at: <http://www.pac.dfo-mpo.gc.ca/fm-gp/licence-permis/areas-secteurs-eng.html>, accessed: May 4, 2016.
- DFO. 2010. Pathways of Effects. Available at: <http://www.dfo-mpo.gc.ca/pnw-ppe/pathways-sequences/index-eng.html>, accessed: May 3, 2016.
- G.L. Williams & Associates Ltd. 1995. Bear River Estuary Shoreline Habitat Classification Final Report. Coquitlam, BC.
- Golder Associates Ltd. 2000. Gravel Aggradation and Dyke Freeboard Assessment Stewart, BC. Vancouver, BC.
- Government of Canada. 2013. Ecological Framework of Canada: Ecoregions of Canada – Northern Coastal Mountains. Available at: <http://ecozones.ca/english/region/185.html>. Accessed: April 26, 2016.
- HAYCO (Hay & Company Consultants Ltd.). 1993. Floodplain Mapping Program – Bear River at Stewart: Design Brief. Prepared for Environment Canada, Inland Waters Directorate and MoE, Water Management Branch.
- IBA (Canada's Important Bird Areas). 2016. Available at: <http://www.ibacanada.ca/mapviewer.jsp?lang=EN>, accessed: May 4, 2016.
- Keystone Environmental Ltd. 2017. 17-HPAC-00206 Request for Additional Information – Stewart World Port Laydown Area and Avalanche Shield Project, Stewart, BC. Stewart Work Port.
- Kistritz Consultants Ltd. 2001. Aquatic Habitat Study of the Gravel Lease Extension in the Bear River Estuary, Stewart, B.C. Submitted to S. Graham Engineering and Geology Inc. Richmond, B.C.

- Lamb, A. and B.P. Hanby. 2005. *Marine Life of the Pacific Northwest – A Photographic Encyclopedia of Invertebrates, Seaweeds and Selected Fishes*. Harbour Publishing, Madeira Park, BC.
- Meidinger, D. and J. Pojar. 1991. *Ecosystems of British Columbia*. BC Ministry of Forests, Victoria, BC. 330pp.
- MELP (BC Ministry of Environment, Land and Parks) and EC (Environment Canada). 2000. *Water Quality Trends in Selected British Columbia Waterbodies*. Available at: http://a100.gov.bc.ca/appsdata/acat/documents/r11341/WatTrendFeb29_1197505951643_8e248a68ce6b9087e80a3a941d98729ec26b3242908.pdf, accessed: May 2, 2016.
- MOE (Ministry of Environment). 2017. *British Columbia Approved Water Quality Guidelines, Aquatic Life, Wildlife and Agriculture*. Accessed December 12, 2017 at: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/wqgs-wqos/approved-wqgs/wqg_summary_aquaticlife_wildlife_agri.pdf
- MOE. 2016a. *Habitat Wizard database*. Available at: <http://www.env.gov.bc.ca/habwiz/>, accessed: May 2, 2016.
- MOE. 2016b. *Fisheries Inventory Data Queries (FIDQ)*. Available at: <http://a100.gov.bc.ca/pub/fidq/infoSingleWaterbody.do>, accessed: March 3, 2016.
- MOE. 2005. *A Users' Guide to Working In and Around Water: Understanding the Regulation Under British Columbia's Water Act*. Ministry of Environment, Water Stewardship Division. Last Updated March 2009.
- MOE. 2004. *Standards and Best Management Practices for Instream Works (SBPISW)*.
- MOE. 2001. *Ambient Water Quality Guidelines (Criteria) for Turbidity, Suspended and Benthic Sediments*. Environmental Protection Division. Available at: <http://www.env.gov.bc.ca/wat/wq/BCguidelines/turbidity/turbidity.html>, accessed: May 2, 2016.
- MWLAP (Ministry of Water, Land and Air Protection). 2002. *A Field Guide to Fuel Handling, Transportation and Storage*. Third Edition, February 2002.
- NHC (Northwest Hydraulics Consultants) 2016A. *World Port groyne / avalanche protection feature and laydown area geomorphic and hydraulic assessment*. Stewart World Port. 25 pp.
- NHC (Northwest Hydraulic Consultants Ltd.). 2016B. *District of Stewart Flood and High Groundwater Mitigation Plan – Phase 1: Baseline Conditions Assessment*. 206 pp.
- NHC (Northwest Hydraulic Consultants Ltd.). 2016C. *District of Stewart Flood and High Groundwater Mitigation Plan – Phase 2: Mitigation Options Analysis*. 107 pp.
- NHC (Northwest Hydraulic Consultants Ltd.). 2016D. *District of Stewart Flood and High Groundwater Mitigation Plan – Phase 3: Flood and High Groundwater Mitigation and Adaptation Plan*. 31 pp.

- NHC (Northwest Hydraulic Consultants Ltd.). 2015. District of Stewart Flood and High Groundwater Mitigation Plan – Phase 1: Baseline Conditions Summary Report. Draft Report.
- Noble, C., W. Challenger, and Nisga'a Fisheries. 2015. Nass River Eulachon 2014 Abundance Estimation: Training, Egg and Larvae Monitoring, and Bear River Eulachon Assessment. LGL Limited: Environmental Research Associates.
- Northwest Avalanche Solutions Ltd, 2015. Arrow and Silverado Avalanche Path Engineering Studies Summary. Stewart World Port, 21 pp.
- SWP (Stewart World Port). 2016. Pers. Comm. with Northwest Hydraulic Consultants.
- SWP. 2014. Management Plan. Stewart World Port. Industrial – General – Version 2. 12/15/2014.
- WSC (Water Survey of Canada). 2014. Daily Discharge Graph for Bear River above Bitter Creek (08DC006) Available at: http://wateroffice.ec.gc.ca/report/report_e.html?type=h2oArc&stn=08DC006, accessed: March 3, 2016.

APPENDIX 1

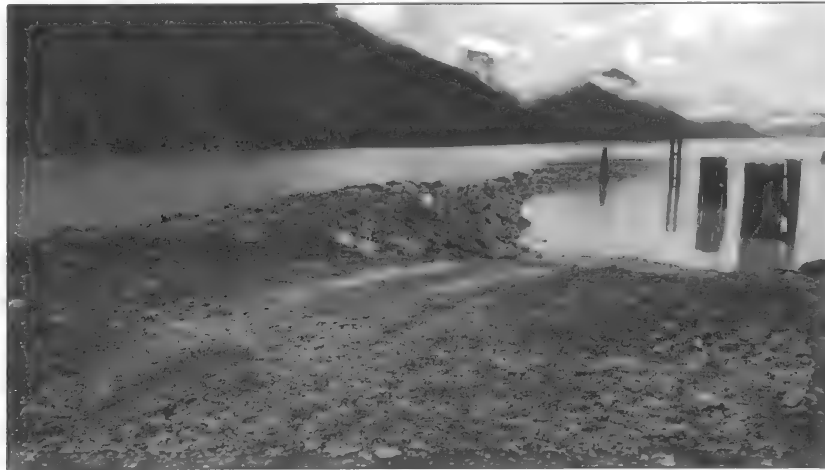
PHOTOGRAPHS



Photograph 1: Aerial view of the Site at low tide looking southeast.



Photograph 2: Aerial view of the Site at low tide looking southeast. The emergency avalanche groyne constructed in May 2016 is visible in the center of the photo.



Photograph 3: View of the proposed northern portion of the avalanche shield area looking south.



Photograph 4: View of the proposed southern portion of the avalanche shield area at low tide.

APPENDIX 2

ENVIRONMENTAL MONITORING PLAN

Environmental Monitoring Plan

Environmental monitoring will be conducted by qualified personnel. The Environmental Monitor (EM) will perform the works under the supervision of a Registered Professional Biologist (R.P.Bio.) with documented experience in marine construction project monitoring under *Fisheries Act* Authorizations. The EM will be knowledgeable in the works being performed, mitigation measures or activities required.

The EM will be responsible for communicating the mitigation measures and BMPs to be implemented by the construction crew, and for ensuring developed objectives and standards of practices described in *A Users' Guide to Working In and Around Water* (MOE, 2005) and *Standards and Best Management Practices for Instream Works* (SBPISW; MOE, 2004) are followed. Records will be kept of the initial environmental orientation and any subsequent guidance provided by the EM to the construction crew.

The EM shall be granted (in writing, by the contractor conducting the works) the authority to stop works. The Environmental Monitoring Plan will establish communication procedures between the EM, SWP, the Contractor, and any other on-site consultants, such as engineers or biologists. It is expected all communications will be through SWP's Project Manager, or their delegate. All works performed by the EM will be conducted in a safe manner. Daily Health and Safety tailgate forms will be completed and safety will be considered over any other requirements.

1.1 General

The EM will be responsible for documenting with notes and photographs:

- Construction activities;
- Water quality measurements;
- Mitigation measures in place;
- Effectiveness of mitigation measures;
- Any non-compliance observations with the Aquatic Effects Assessment (AEA), and
- Recommendations to prevent harm to fish and fish habitat, including marine mammals

The monitoring program will be implemented to assess the effectiveness of the measures and standards proposed in Mitigation Section of the AEA, as well as to ensure compliance with environmental regulations and fulfill contract, permit and approval requirements. In summary, monitoring measures will include, but will not be limited to:

- Full time monitoring of all in-water works.
- Spot checks after works have been completed to check water quality if intertidal works were conducted in the dry (conducted within two hours of dry areas becoming wetted by the tide).
- Visual inspections of equipment and site cleanliness.
- Assessment of the adequacy of onsite fuel storage and transfer procedures.

- Assessment of the adequacy of onsite spill response equipment and training provided to the construction crew.
- Visual inspection of the silt fence installed at the top of slope along the causeway for deficiencies.
- Visual inspections of the silt curtain for deficiencies prior to the start of in-water works for the day and throughout working hours.
- Assessments of the Project footprint (i.e. within the isolation barrier) at low tides.
- Observations for the presence of fish, marine birds and marine mammals within the Project footprint and safety zones. Any observed fish kill or evidence of injuries to fish will result in an immediate shut down of works and will be immediately reported to Fisheries and Oceans Canada (DFO), SWP, and the contractor.
- Collection of *in situ* turbidity and temporary suspended solids (TSS) measurements at the commencement of infilling works to ensure water quality criteria remain within the established thresholds detailed in Table 1 below.

1.2 Water Quality Measurements

Full time water quality monitoring during in-water works will occur. Water quality measurements will be collected in accordance with the following:

- At the surface, at the midpoint between surface and seabed, and at the seabed.
- Measurements will be collected at the identified locations shown on Figure 8 i.e. at 0m, 25m and 100m from the silt curtain.
- A minimum of 2 hour increments between sampling rounds will be implemented during active construction works.
- Background readings will be collected ideally before daily works commence and upcurrent of the project (one up river, one up current depending on tidal movement). If background readings are collected after works begin, readings will be taken 500 m seaward of in-water works.
- The EM will create a TSS to NTU calibration curve by collecting sediment and creating at least 3 different levels of turbidity, and sending the samples to a lab for testing. The curve will be used to approximate TSS on the subsequent days of monitoring.
- Water quality will conform to the BC Water Quality Guidelines outlined in Table 1:
 - If measurements do not meet compliance at 100 m from the edge of the silt curtain (i.e. the compliance point), works will cease immediately and additional mitigation measures and/or repair of the isolation barrier will occur.
 - If measurements do not meet compliance 25 m from the silt curtain (warning station), a warning will be provided to the contractor. Works will cease if measurements do not meet water quality criteria within two hours. Works will recommence once levels return below water quality criteria.

Table 1 Water Quality Criteria for Turbidity and Suspended Sediments

Water Use	Turbidity	Non-filterable Residue (Total Suspended Solids)
Aquatic Life (Fresh, Marine, Estuarine)	<ul style="list-style-type: none"> Change from background of 8 NTU at any one time for a duration of 24 h in all waters during clear flows or in clear waters Change from background of 2 NTU at any one time for a duration of 30 d in all waters during clear flows or in clear waters Change from background of 5 NTU at any time when background is 8–50 NTU during high flows or in turbid waters Change from background of 10% when background is > 50 NTU at any time during high flows or in turbid waters 	<ul style="list-style-type: none"> Change from background of 25 mg/L at any one time for a duration of 24 h in all waters during clear flows or in clear waters Change from background of 5 mg/L at any one time for a duration of 30 d in all waters during clear flows or in clear waters Change from background of 10 mg/L at any time when background is 2–100 mg/L during high flows or in turbid waters Change from background of 10% when background is > 100 mg/L at any time during high flows or in turbid waters

1.3 Marine Mammal Monitoring

The EM will be responsible for monitoring the established 500 m cetacean safety zone and 25 m pinniped safety zone from in water works, and discretionary safety zones from the southern point of the silt curtain. If any marine mammals are sighted within their respective safety zones, the EM will call for in water works to cease until the marine mammal has left the perimeter of the safety zone or is not observed for 30 minutes. Documentation of the sighting will be recorded including, but not limited to: location, the date and time of occurrence, species, number of individuals, behavior, and changes in behaviour.

1.4 Fish Salvage Plan

A fish salvage permit will be obtained from DFO by the EM prior to works starting. The EM will be responsible for the relocation of crabs or other marine organisms, if observed, within the project footprint to an adjacent location of similar elevation and substrate type. The EM will conduct beach seining within the silt curtain. If eulachon or other fish are caught, they will be relocated outside of the silt curtain to an area of similar conditions (e.g. near the eastern extent of the Bear River). No excavation is proposed, therefore fish stranding is not expected to occur. In the unlikely event that fish are stranded, the EM will salvage the fish and relocate them into the marine environment, and, instruct the contractor to cut a trench or fill in the fish trap (which ever has least environmental impact). The EM will keep a registry of all species captured and relocated, including date, time, species, size, overall health, capture and release location (GPS coordinates). The project footprint will be checked by the EM four times per day, including once at the beginning prior to construction starting.

1.5 Reporting

In the event of a fish kill or evidence of injuries to fish all available information will be collected (e.g., time, species, location, photographs) and will be immediately reported to DFO (i.e., fishery officer), SWP, and the contractor.

In the event of a spill, the Spill Management Plan will be used to determine reporting requirements.

Environmental monitoring reports will be produced weekly during periods of full-time monitoring. The reports will include a description of works conducted, mitigation measures used, comments on their effectiveness, remedial repairs or recommendations to improve mitigation measures, water quality results, fish and wildlife data include salvage efforts and marine mammal safety zone observations, daily photographs, and description of sampling efforts (e.g., time, location, activity). Reports will be distributed to DFO by the following Monday of the subsequent week.

An "as-built" summary report will be submitted to DFO within 90 days of completion of construction. The report will include a drawing prepared by a BC Land Surveyor showing the constructed works relative to legal lot boundaries with elevations in m Chart Datum, and UTM NAD 83. The report will include a summary of the results of the weekly monitoring reports, and, include an as-built survey of all works constructed. A habitat balance sheet will be created to compare the constructed works to the proposed works. The report will be sealed by a professional biologist with experience in marine construction monitoring, and will include an evaluation of the type of habitats lost and created. The report will include, at a minimum, the actual area of gravel habitat lost within the project footprint.

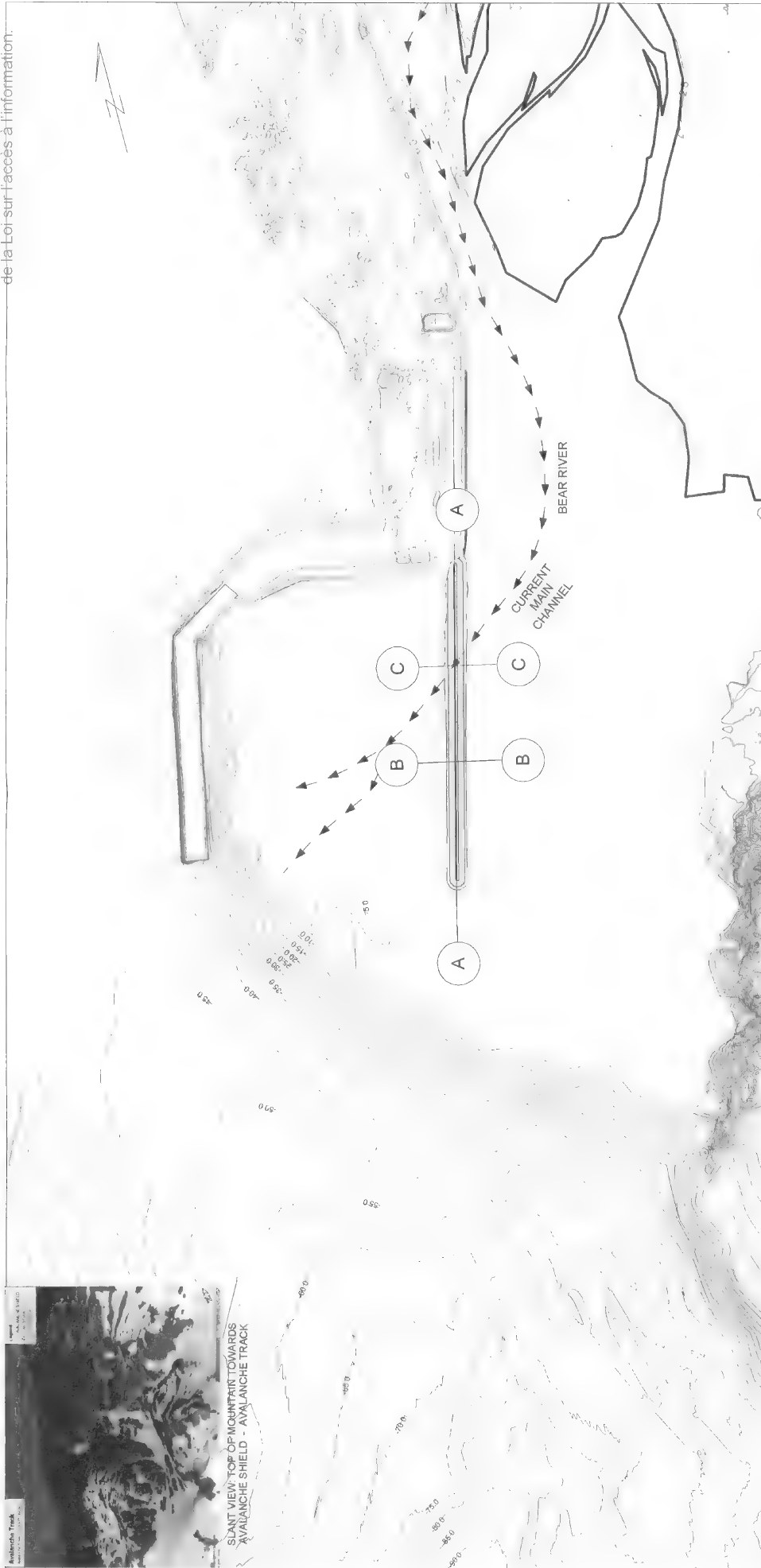
A registry of all marine mammal observations will be submitted to DFO, and a registry of all salvage efforts will be submitted to DFO as an appendix.

APPENDIX 3

ENGINEERED DESIGN DRAWINGS



SLANT VIEW TOP OF MOUNTAIN TOWARDS
 AVALANCHE SHIELD - AVALANCHE TRACK



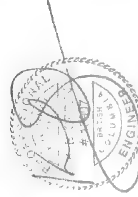
prepared for:

STEWART WORLD PORT
 11421 Alaska Road
 Fort St. John, BC V1J 6N2



AVALANCHE SHIELD GROYNÉ
STEWART HARBOUR
STEWART, BC

ATTACHMENT: PLAN VIEW **AVALANCHE SHIELD GROYNÉ** **STEWART BC**



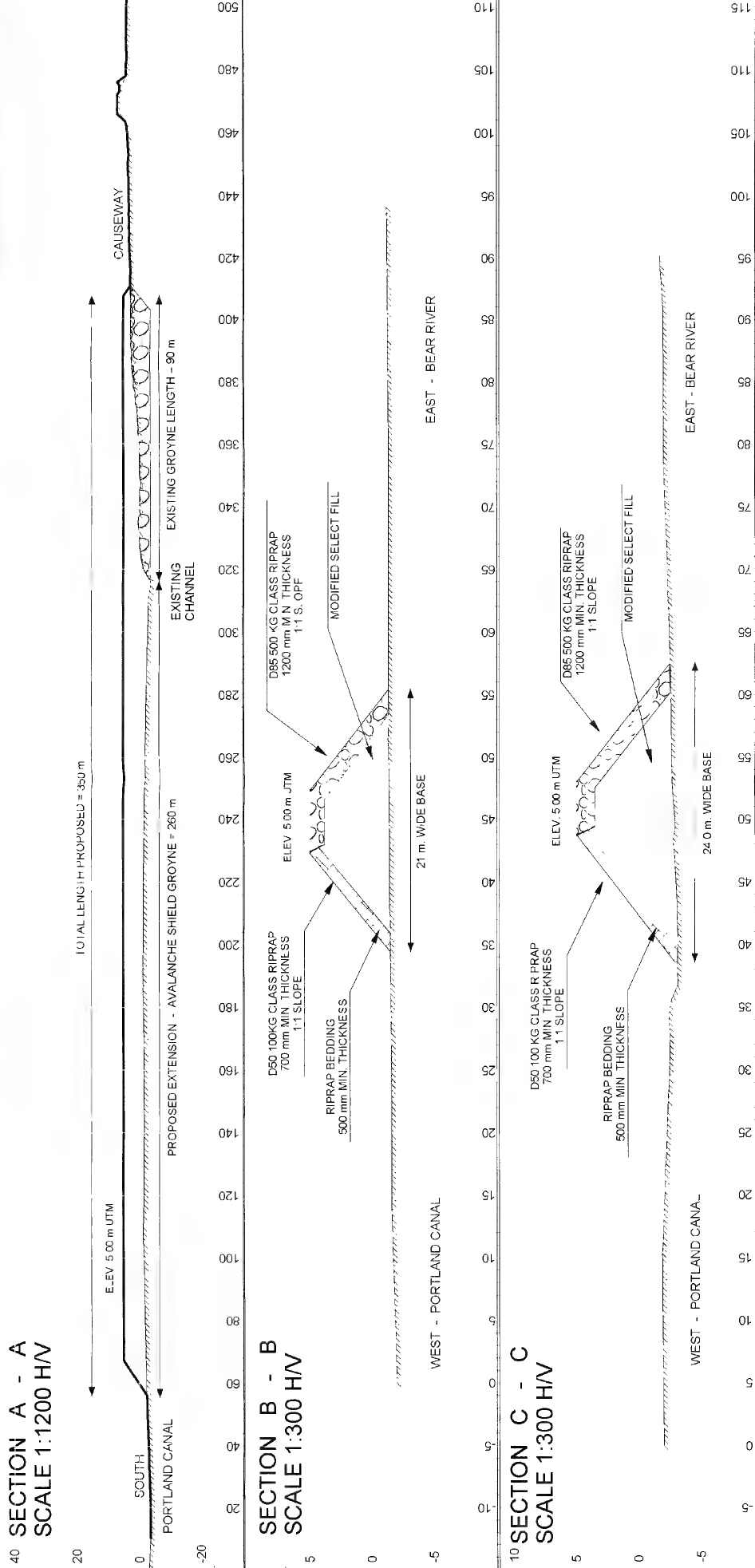
prepared by:

PDM Services Ltd.

PDM
Services Ltd

P.O. Box 419
 New Hazelton BC
 V0J 2J0
 TEL: (250) 842-2256
 KEVIN@PDMSERVICES.CA

CAUTION: DRAWING SCALE MAY BE DISTORTED
 FROM PRINTING. INTENDED FOR 11 x 17 PAPER.
 UTM ELEVATIONS 0m UTM = 3.4 = Chart
 DWG # : 2017-SWP-4-001-REV0
 DECEMBER 7, 2017



prepared for:
STEWART WORLD PORT
11427 Alaska Road
Fort St. John, BC V1J 6N2

**ATTACHMENT: SECTION VIEWS
AVALANCHE SHIELD GROUYNE
STEWART BC**

prepared by:
PDM Services Ltd.
P.O. Box 419
New Hazelton BC
V0J 2J0
TEL: (250) 842-2256
KEVIN@PDMSERVICES.CA

CAUTION: DRAWING SCALE MAY BE DISTORTED
FROM PRINTING. INTENDED FOR 11 X 17 PAPER.
UTM ELEVATIONS 0m UTM = 3.4 m Chart
2007 SWP 4.003 REV0
DECEMBER 7, 2017

APPENDIX 4

PROJECT JUSTIFICATION



**Keystone
Environmental**
Knowledge-Driven Results



P.O. Box 419, New Hazelton, BC, V0J-2J0 778-202-0045

Ted Pickell, CEO
Stewart World Port
11421 Alaska Road
Ft. St. John, BC
December 4, 2017

RE: Dock Encroachment - Bear River Sediments into Estuary

Ted;

I have compared original soundings of the Harbour in 2013 to soundings performed in 2016 and 2017. Reports by NHC have identified an annual rate of expansion of the estuary at about 10m per year. Between 2013 and 2016, the annual rate of expansion towards the dock averaged 15m per year. The rate of expansion between 2016 and 2017 is 25m. Continued expansion at these rates, mid and long term, will effectively cut off marine access to the Stewart Harbour.

The report prepared by NHC for SWP, "World Port... Geomorphic and Hydraulic Assessment" states that an annual volume of 220,000 to 300,000 m³ of sand and gravel is transported annually. The report also states that "... historical growth patterns suggest that the delta will continue to grow outwards to the south and the west through a complex network of tidal channels that convey relatively large amounts of sediment and water to specific parts of the delta before filling in and moving to a new location on the delta causing an unpredictable growth pattern". These statements imply that predicting the dispersal of up to 300,000m³ of sands and gravels on the estuary cannot be confirmed and is unmanageable without control measures.

The effect of extended wet weather is a critical factor in determining worst case scenarios. It can be assumed (from records for Prince Rupert) that Aug-Oct 2017 period was wetter than average, by a factor of at least 2. The carrying capacity of the higher flows would account for the surge of the estuary near the Dock. It is highly likely that a repetition of wet weather would result in similar surges that will impact the Dock, and consecutive years could limit the life of the Dock to less than 3 years. The implication of a dredge program to mitigate the surges requires financial commitment and necessary permits, and this could possibly be an annual occurrence.

To protect the Dock from the growth of the estuary, a structure is required to maintain main channel flows in a southerly direction beyond the zone of Dock impact. This tactic supports the long-term strategy of controlling the flows of the Bear River in a manner that protects the investment of the Stewarts marine industrial facilities while ensuring flood control objectives are met.

This matter is urgent. There is no indication that a change in the present direction of the main channel is pending. The 25m surge occurred in the last 4 months, when over 700mm of rain was registered in Prince Rupert. It is possible that an unabated condition would see a surge of over 50m in 8 months, jeopardizing the Dock access. The solution is to build a permanent berm that extends beyond the length of the Dock, at a top elevation that is above High-High Tide levels and strength to secure permanency.

Kevin Orpen P Eng



P.O. Box 419, New Hazelton, BC, V0J-2J0 778-202-0045

Fact Sheet – Bear River Delta Expansion

Pre-2013

In 1968, the Bear River Delta Front was located at approximately the southern end of the current causeway. Comparing 1968 to 2013, the Delta Front advanced 487 m, or an average of 9.9 m per year. The width of the Tidal Delta was 550 m, and the causeway was built 300 m south of the bridge and the final 400m was built before 1989. By 1989, the first berm was built to provide protection for barge loading facilities. By 1994, the berm was eroded back to the hook at the existing berm.

2013 to 2016

The Stewart Harbour was surveyed with soundings to provide baseline ground profile of the dock for designers. Between this survey and the first monitoring survey in 2016, the Delta Front advanced 47 m, or an average of 15.7 m per year.

The Dock was constructed between 2014 and 2015.

In 2015, a new berm was constructed to a total length of 220 m, deflecting the growth of the Delta Front in a southerly direction. The new berm was removed in Feb 2016, including the original berm. Following an emergency notification that the Bear River had changed course and was flowing directly into the Dock, the original berm was replaced in Aug. 2016. The Stewart Harbour was re-surveyed in October.

2016 to 2017

The current berm fails to provide a deflection of the Bear River to a southerly flow. The Delta Front has advanced 9.6 m to the south, and 25.5 m to the west/southwest. The surge to the west impacts the southern half of the Dock severely, as the piles have been covered with 7 to 11 m of sediment at a slope of 50% (2:1) on the east side of the Dock. At this time, new sediment deposits have reached the west piles and are entering the Stewart Harbour Basin. The Dock has lost 25% of freeboard on the east side, and is forecasted to lose operational freeboard on the west side in less than 4 years.

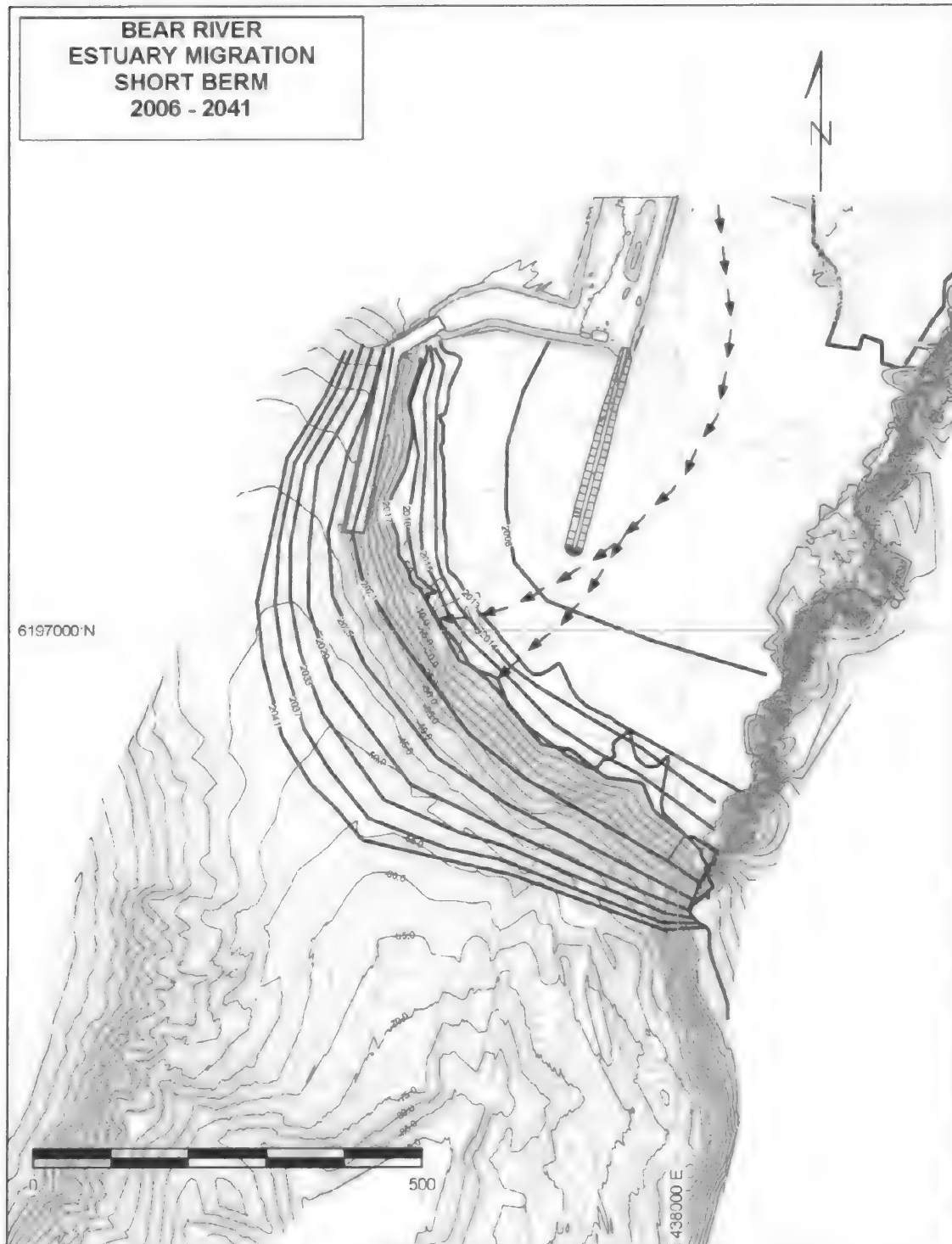
The westerly Tidal Delta expansion appears to be a natural event caused by the swinging of the main channel of the Bear River to the west. As suggested by NHC in their various reports, the bedload of materials in the Bear River that originated from valley wall failures in the Bitter Creek drainage is substantial. Materials are being carried at an accelerated rate, and wet weather conditions are a substantial factor of the acceleration. Continued expansion to the west of the Dock will impact the Stewart Harbour as the basin is shallower than the Dock. In terms of a timeline, all of the mouth of the Stewart Harbour will be filled in with 20 years. This will foreclose the ability for all marine operators to utilize the west side of the Harbour for deep water access.

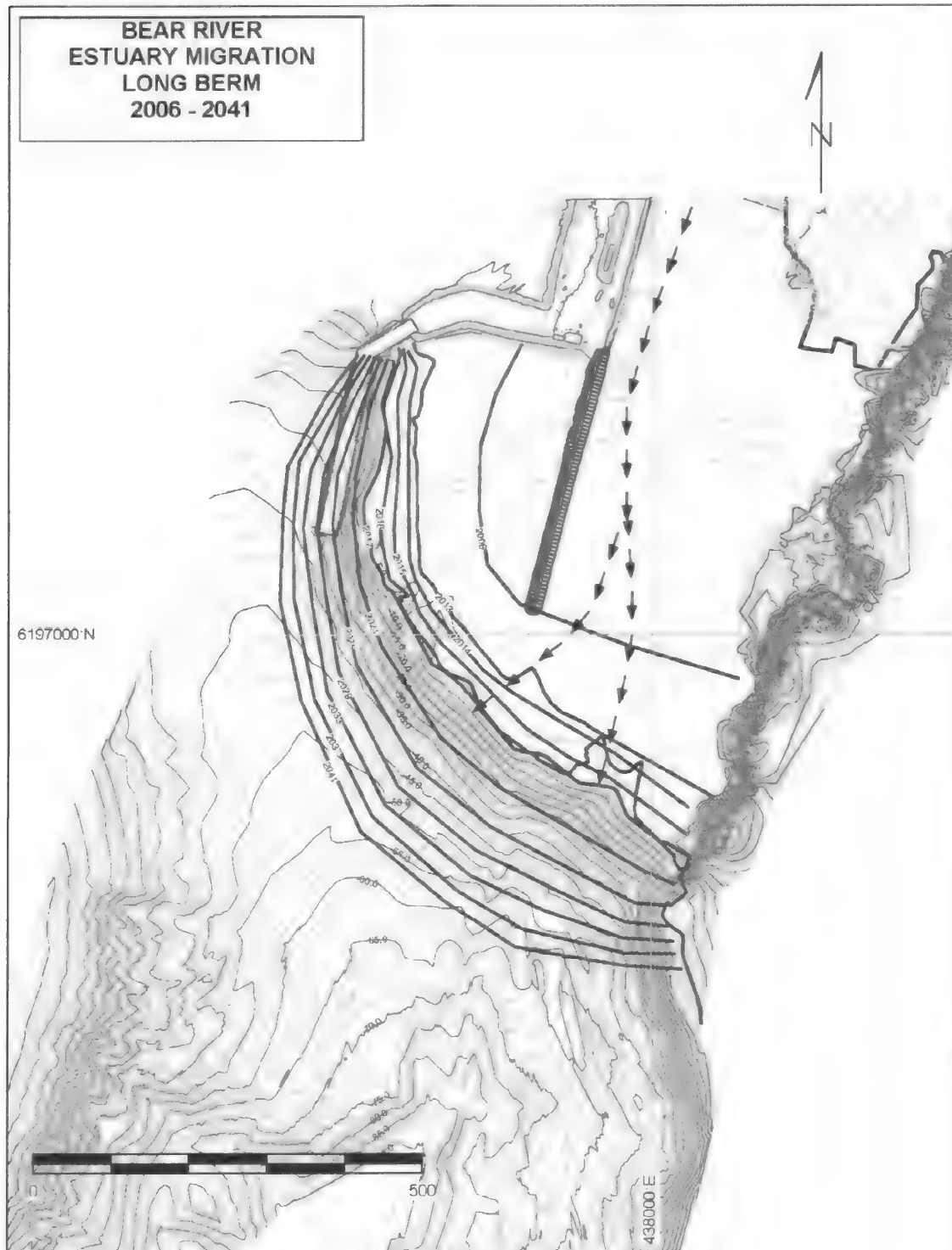
Recommendation

The main channel of the Bear River must be managed so that it does not impede upon the Stewart Harbour. It is proposed that a berm be constructed to extend 350 m from the causeway. This is an additional 75 m from earlier proposal. The alignment should follow the current west shore of the causeway that follows the Bear River. This would provide a shear line effect that would not abruptly cause a change of channel alignment. The top of the berm should be above High-High-Water tide.

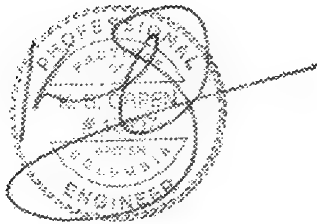
The following two images show;

1. Estuary Migration – Short Groyne
2. Estuary Migration – Long Groyne





This information is provided for reference to activities related to the Stewart World Port and the effect of the movement Delta Front towards the Dock. Recommendations are provided as can be based on information and data collected to date.



Kevin Orpen P. Eng.

December 8, 2017

APPENDIX 5

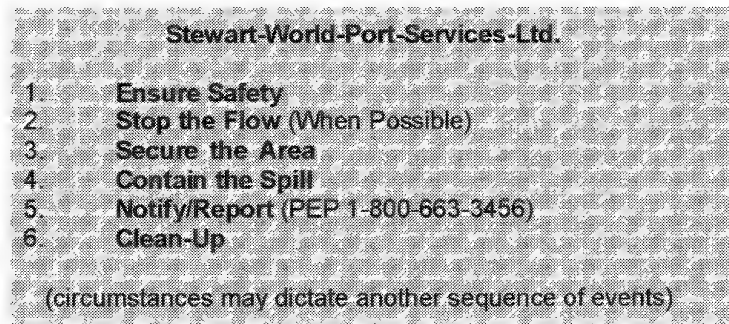
ENVIRONMENTAL RESPONSE PLAN



**Keystone
Environmental**
Knowledge-Driven Results

SWP SPILL RESPONSE PLAN

The contractor conducting works will be responsible for executing this spill response plan. This spill response plan must be posted onsite in a visible location. If a spill of fuel, oils, lubricants or other harmful substances occurs, the following procedures shall be implemented.



1. Ensure Safety

- Ensure personal/public, electrical and environmental safety Wear appropriate Personal Protective Equipment (PPE)
- Never rush in, always determine the product spilled before taking action Warn people in immediate vicinity
- Ensure **no ignition sources** if spill is of a flammable material

2. Stop the Flow (when possible)

- Act quickly to reduce the risk of environmental impacts
- Close valves, shut off pumps or plug holes/leaks, set containers upright Stop the flow of the spill at its source

3. Secure the Area

- Limit access to spill area
- Prevent unauthorized entry onto site

4. Contain the Spill

- Block off and protect drains and culverts
- Prevent spilled material from entering drainage structures (ditches, culverts, drains) Use spill sorbent material to contain spill

- If necessary, use a dike or any other method to prevent any discharge off site. Make every effort to minimize contamination.
- Contain as close to the source as possible.

5. Notify/Report

- The following individuals shall be notified within two hours of any spill occurring:

Table 1 Project Contact Details

Name	Company	Role	Cell	Email
Brad Pettit	Stewart World Port Ltd.	Director of Operations	250-961-0215	bpettit@stewartworldport.com
Kevin Orphan	Arctic Construction	Professional Engineer	*	ko@arctic-const.ca
Warren Appleton	Keystone Environmental Ltd.	Professional Biologist	604-996-7113	wapleton@keystoneenvironmental.ca
Brad Moffat	Stewart World Port	Regulatory Lead	250-819-4341	bmoffat@stewartworldport.com
*	*	Environmental Monitor	*	*

*Blank field to be determined prior to start of work.

- When necessary the first external call is to be made to (see spill reporting requirements):

Provincial Emergency Program (PEP) 1-800-663-3456 (24 hour)

Provide necessary spill details to other external agencies (see spill reporting requirements)

Table 2 Notification Chart

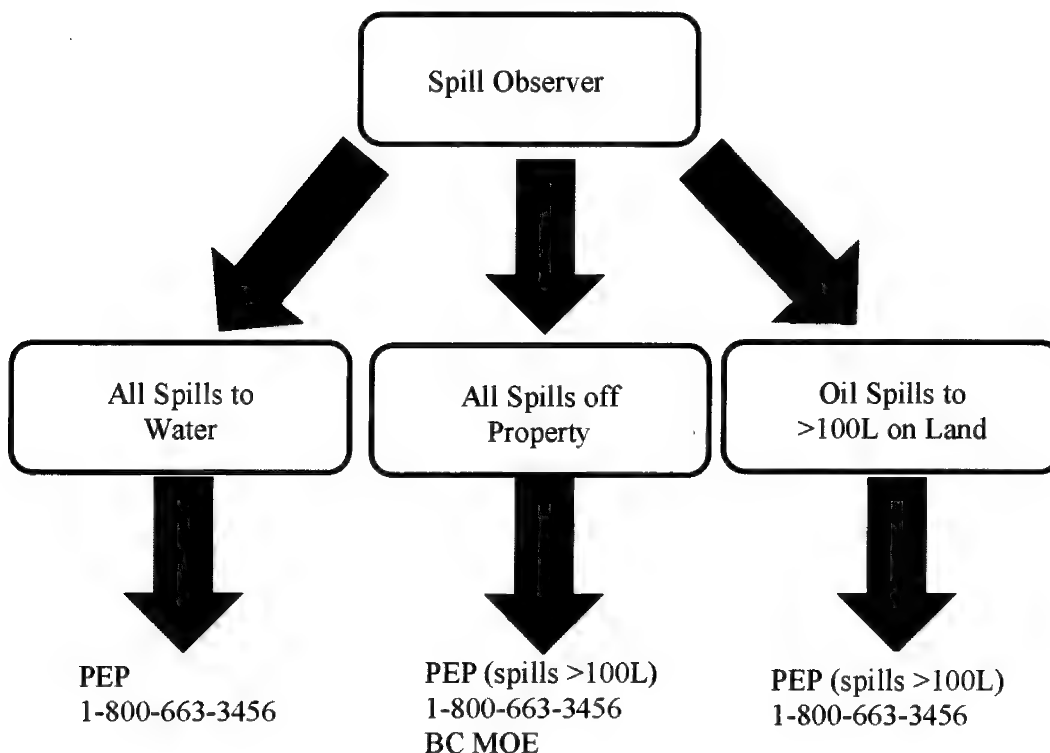


Table 3 List of Externally Reportable Quantities for Commonly Used Substances

Product	Quantity
Class 2.1 – flammable gas (e.g., propane)	10 kg or 10 min.
Class 2.2 – non-flammable gas (e.g., SF6, CO2)	10 kg or 10 min.
Class 3 - flammable liquids	100 litres
Class 8 - corrosive liquid acids and caustics (e.g., battery acid)	5 kg or litres
Class 9 – environmentally hazardous (e.g., PCBs, used ethylene glycol)	5 kg or litre
Oil & Waste Oil	100 litres
Other Substances (e.g., new antifreeze, power-wash water)	200 kg or litres
Pesticides & Herbicides	1 kg or litre

Note: All spills to water are reportable. If in doubt as to whether or not to report a spill, err on the side of caution and report the spill.

6. Clean-up

All equipment and/or material used in clean-up (e.g. used sorbents, oil containment materials etc.) must be disposed of in accordance with BC Ministry of Environment (MOE) requirements.

Accidental spills may produce hazardous wastes (e.g., material with > 3% oil) and contaminated soil and/or water. All waste disposal must comply with *the BC Environmental Management Act* and its regulations.

Waste sorbent material may not be disposed of in a landfill without prior approval from MOE and the landfill operator.

Contaminated soil and/or water must be treated and dealt with as required on a site-specific basis and must comply with the requirements of the BC Contaminated Sites Regulation.

Table 4 Site Emergency Spill Response Kit Contents

Quantity	Description
200 (each)	Polypropylene Sorbent Pads 18"X18"X3/8" (Oil and Antifreeze)
1	Polypropylene Sorbent booms 5" ø.
1 (each)	Polypropylene Sorbent Sweep 19"X20' (Oil and Antifreeze)
2 (each)	Polypropylene Sorbent Socks 3" ø. X 4ft. (Oil and Antifreeze)
1 (each)	Polypropylene Sorbent Sock 3" ø. X 10ft. (Oil and Antifreeze)
1	Treated Oil Cellulose Particulate
1	Neoprene Drain Cover 48"X48"X1/8"
6	Poly. Disposal Bags (sized for 45 Gal. drum, Minimum 6 mil)
1	Barrier Tape, Yellow "Caution Do Not Enter"
2 pair	Nitrile Gloves Large
2 pair	Nitrile Gloves Extra Large
100 feet	Polypropylene Rope, Yellow 1/4"
1	Garden Rake (Non Sparking)
1	Shovel (Non Sparking)
30	Empty Sand Bags 14"X22"
1	Roll Poly. Plastic Sheet 100'X6'X6 mil thickness
1	Roll Duct Tape 180'X2"
1	Roll "Kimwipes" Hand Towelettes
1 pair	Rubber Boots with Steel Toe and Plate, size 10
1 pair	Rubber Boots with Steel Toe and Plate, size 12
1	Kit Container Marked "Spill Response Kit"
1	Tool Box (contents listed below)

Quantity	Description
1	Soap Bar (Ivory Bath Size)
1	Epoxy Plug Stick (Both Hydrocarbon and Antifreeze Compatible)
1	Multiple Head Screwdriver
1	Utility Knife (all stainless construction)
2	Indelible Markers
6	Blank Labels for plastic bags
6	Plastic Bag Ties
1	8" Crescent Wrench
1	Spill Response Card
1	List of Kit Contents

ATTENTION
IMMEDIATE REPLACEMENT OF ANY SITE SPILL RESPONSE MATERIALS USED IS
MANDATORY

Table 5 Vehicle Emergency Spill Response Kit Contents.

Quantity	Description
2 (each)	10' Oil and 10' Antifreeze Socks
15	Polypropylene sorbent pads (Oil and Antifreeze) 18"X18"X3/8"
1	Neoprene Mat (Drain Cover) 48"X48"X1/8"
1	250ml Glass Sampling Jar with Lid and Eye Dropper
1	25ml Amber Bottle with Lid
2	Sample Jar Labels and Chain of Custody Doc.
2	10 Quart Cellulose Sorbent Material, Oil Only
1	Barrier Ribbon, Yellow "Caution Do Not Enter"
1	Poly Disposal Bags (45 Gal. Drum size, minimum 6 mil)
1	Blank Labels for plastic bags
1	Plastic Bag Tie
1	Epoxy Plug Compound (Hydrocarbon Compatible)
1	Spill Kit Container Marked "Spill Response Kit"
1	Spill Response Card
1	List of Kit Contents

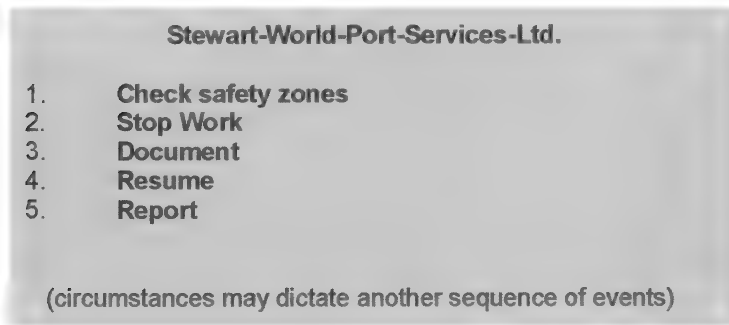
ATTENTION
IMMEDIATE REPLACEMENT OF ANY SITE SPILL RESPONSE MATERIALS USED IS
MANDATORY

APPENDIX 6

MARINE MAMMAL MONITORING PLAN

SWP MARINE MAMMAL SAFETY PLAN

The EM will execute the following marine mammal safety plan while conducting environmental monitoring of works at SWP.



1. Check Safety Zones

The following safety zones will be in effect during the site preparation and construction phases of the project.

Table 1 Marine Mammal Safety Zone Distances

Safety Zone Type	Distance and Reference Point
Cetacean Safety Zone	A 500 m cetacean safety zone will be established from in water works.
Cetacean Discretionary Safety Zone	A 500 m cetacean discretionary safety zone will be established from the project footprint (i.e. silt curtain).
Pinniped Safety Zone	A 25 m pinniped safety zone will be established from in water works
Pinniped Discretionary Safety Zone	A 25 m pinniped discretionary safety zone will be established from the project footprint (i.e. silt curtain

The environmental monitor will be responsible for checking the marine mammal safety zones at the following frequencies:

Table 2 Frequency of Monitoring Marine Mammal Safety Zones

Safety Zone Type	Distance and Reference Point
Cetacean Safety Zone	Prior to daily start-up Every 30 m during in-water works
Cetacean Discretionary Safety Zone	Prior to daily start-up Every 30 m during in-water works
Pinniped Safety Zone	Prior to daily start-up Every 30 m during in-water works
Pinniped Discretionary Safety Zone	Prior to daily start-up Every 30 m during in-water works

The methods of monitoring the marine mammal safety zones will be as follows:

Table 3 Marine Mammal Safety Zones Monitoring Method

Safety Zone Type	Distance and Reference Point
Cetacean Safety Zone	Visual during daylight hours Hydrophone during reduced visibility or at night if in-water works are occurring
Cetacean Discretionary Safety Zone	Visual during daylight hours Hydrophone during reduced visibility or at night if in-water works are occurring
Pinniped Safety Zone	Visual
Pinniped Discretionary Safety Zone	Visual

2. Stop Work

The contractor will provide in writing to the environmental monitor the authority to issue a stop work order if a marine mammal is observed within the safety zones identified above. The environmental monitor will issue the stop work order or issue a warning to the contractor as described in Table 4.

Table 4 Marine Mammal Safety Zones Monitoring Method

Safety Zone Type	Distance and Reference Point
Cetacean Safety Zone	Automatic shutdown of in-water works
Cetacean Discretionary Safety Zone	Environmental monitor to warn construction crews of possible shut-down
Pinniped Safety Zone	Automatic shutdown of in-water works
Pinniped Discretionary Safety Zone	Environmental monitor to warn construction crews of possible shut-down

3. Document

The environmental monitor will keep a registry of marine mammal safety zone sampling efforts and results. The registry will look like the table below.

Table 5 Marine Mammal Safety Zones Registry

Date	Time	Method	Distance from In-Water Works	Distance from Silt Curtain	Species	Activity / Response	Comments
2017-12-08	10:00am	visual	-	-	None observed	-	-
2017-12-08	10:30am	visual	600 m	400 m	Orcinus orca	feeding	unaffected by works
2017-12-08	11:00am	visual	-	-	None observed	-	-

4. Resume

If the marine mammal has not been observed for the following time periods, in-water work activities may resume.

Table 6 Resuming Works

Safety Zone Type	Distance and Reference Point
Cetacean Safety Zone	No sightings for 30 minutes
Cetacean Discretionary Safety Zone	-
Pinniped Safety Zone	No sightings for 30 minutes
Pinniped Discretionary Safety Zone	-

5. Report

The following shall be notified is a stop order is issued:

Table 7 Project Contact Details

Name	Company	Role	Cell	Email
Brad Pettit	Stewart World Port Ltd.	Director of Operations	250-961-0215	bpettit@stewartworldport.com
Kevin Orphan	Arctic Construction	Professional Engineer	*	ko@arctic-const.ca
Warren Appleton	Keystone Environmental Ltd.	Professional Biologist	604-996-7113	wapleton@keystoneenvironmental.ca
Brad Moffat	Stewart World Port	Regulatory Lead	250-819-4341	bmoftat@stewartworldport.com
*	*	Environmental Monitor	*	*

*Blank field to be determined prior to start of work.

Registry results are to be included in the environmental monitors monitoring reports as an appendix. If a marine mammal is harmed, the environmental monitor shall report the harm to DFO within two hours. DFO contact information to be provided within the Fisheries Act Authorization for the project.

APPENDIX 7

EULACHON MONITORING PLAN

SWP EULACHON SAFETY PLAN

The EM will execute the following eulachon safety plan while conducting environmental monitoring of works at SWP.

Stewart-World-Port-Services-Ltd.

1. Check safety zones
2. Stop Work
3. Document
4. Resume
5. Report

(circumstances may dictate another sequence of events)

1. Check Safety Zones

The environmental monitor shall have the appropriate permits to salvage eulachon prior to executing this plan. The following safety zones will be in effect during the site preparation and construction phases of the project.

Table 1 Eulachon Safety Zone Distances

Safety Zone Type	Distance and Reference Point
Eulachon Safety Zone	An eulachon safety zone will be established along the perimeter of the silt curtain
Eulachon Discretionary Safety Zone	A 500 m eulachon discretionary safety zone will be established from the project footprint (i.e. silt curtain).

The environmental monitor will be responsible for checking the eulachon safety zones at the following frequencies:

Table 2 Frequency of Monitoring Eulachon Safety Zones

Safety Zone Type	Distance and Reference Point
Eulachon Safety Zone	Prior to daily start-up Every 2 hours during in-water works that occur from Feb 15 to July 1
Eulachon Discretionary Safety Zone	Once a day if in-water works occur between Feb 15 and July 1

The methods of monitoring the eulachon safety zones will be as follows:

Table 3 Eulachon Safety Zones Monitoring Method

Safety Zone Type	Distance and Reference Point
Eulachon Safety Zone	Visual during daylight hours Min 3 m beach seine at random locations for 10 minutes
Eulachon Discretionary Safety Zone	Visual during daylight hours Min 3 m beach seine at random locations for 10 minutes

2. Stop Work

The contractor will provide in writing to the environmental monitor the authority to issue a stop work order if eulachon are observed within the safety zones identified above. If eulachon are stranded, the environmental monitor will relocate them outside the work area to similar conditions (depth, salinity) as shown in Figure 1.



Figure 1 Fish Release Locations

The environmental monitor will issue the stop work order or issue a warning to the contractor as described in Table 4.

Table 4 Eulachon Safety Zones Monitoring Method

Safety Zone Type	Distance and Reference Point
Eulachon Safety Zone	Automatic shutdown of in-water works
Eulachon Discretionary Safety Zone	Environmental monitor to warn construction crews of possible shut-down

3. Document

The environmental monitor will keep a registry of eulachon safety zone sampling efforts and results. The registry will look like the table below.

Table 5 Eulachon Safety Zones Registry

Date	Time	Method	Distance from In-Water Works	Distance from Silt Curtain	Species	Activity / Response	Comments
2017-12-08	8:30am	seine	-	-	None observed	-	-
2017-12-08	10:30am	seine	5 m	Inside	Thaleichthys pacificus	migration	unaffected by works
2017-12-08	12:30am	seine	20m	5m	Thaleichthys pacificus	migration	unaffected by works

4. Resume

If the eulachon have not been observed for the following time periods, in-water work activities may resume.

Table 6 Resuming Works

Safety Zone Type	Distance and Reference Point
Eulachon Safety Zone	No sightings for 2 hours
Eulachon Discretionary Safety Zone	-

5. Report

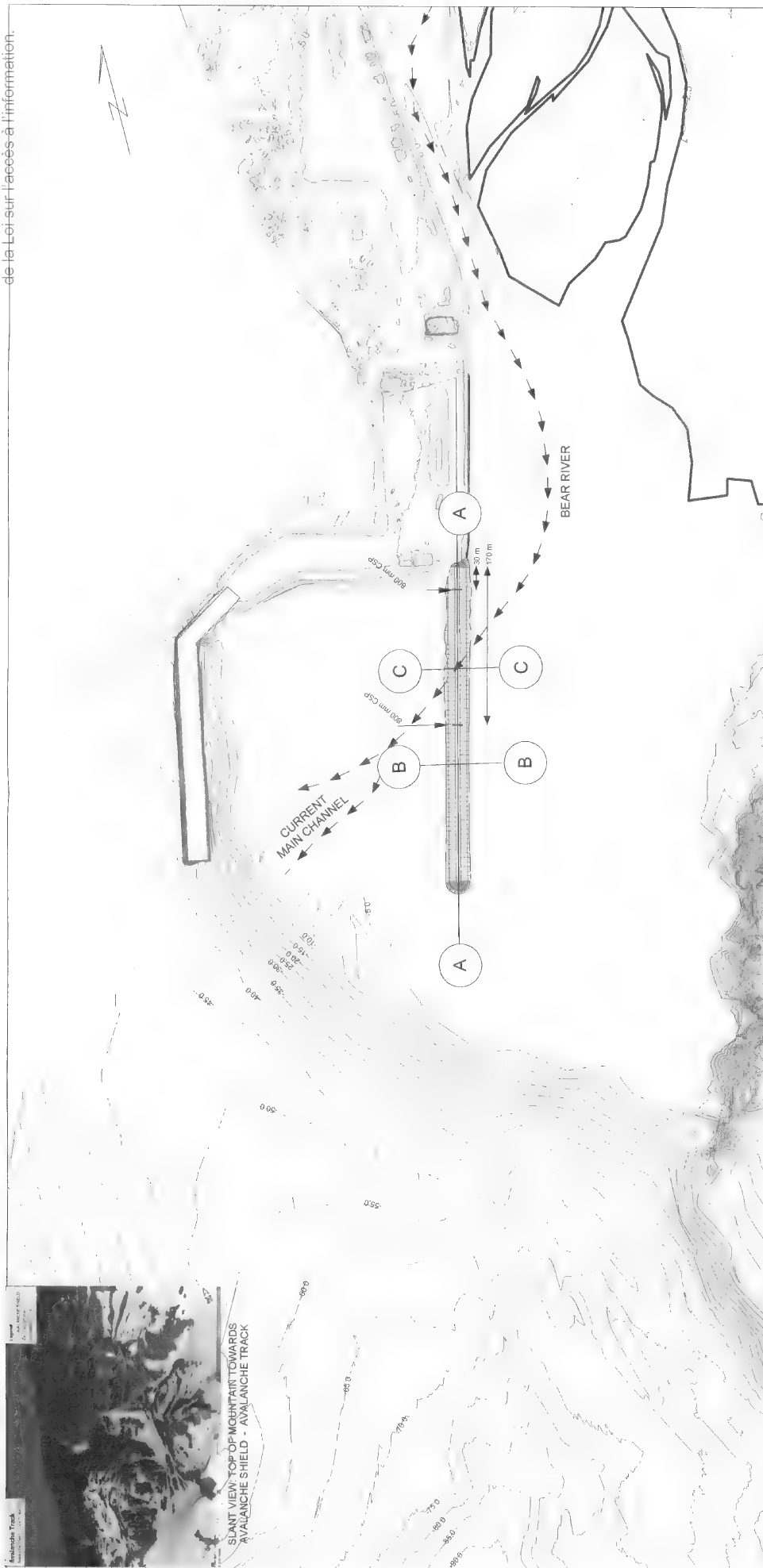
The following shall be notified is a stop order is issued:

Table 7 Project Contact Details

Name	Company	Role	Cell	Email
Brad Pettit	Stewart World Port Ltd.	Director of Operations	250-961-0215	bpettit@stewartworldport.com
Kevin Orphan	Arctic Construction	Professional Engineer	*	ko@arctic-const.ca
Warren Appleton	Keystone Environmental Ltd.	Professional Biologist	604-996-7113	wappleton@keystoneenvironmental.ca
Brad Moffat	Stewart World Port	Regulatory Lead	250-819-4341	bmoффat@stewartworldport.com
*	*	Environmental Monitor	*	*

*Blank field to be determined prior to start of work.

Registry results are to be included in the environmental monitors monitoring reports as an appendix. If eulachon are harmed, the environmental monitor shall report the harm to DFO within two hours. DFO contact information to be provided within the Fisheries Act Authorization for the project.

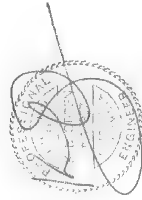


STEWART WORLD PORT
11421 Alaska Road
Fort St. John, BC V1J 6N2



ATTACHMENT: PLAN VIEW
AVALANCHE SHIELD GROYN
STEWART BC

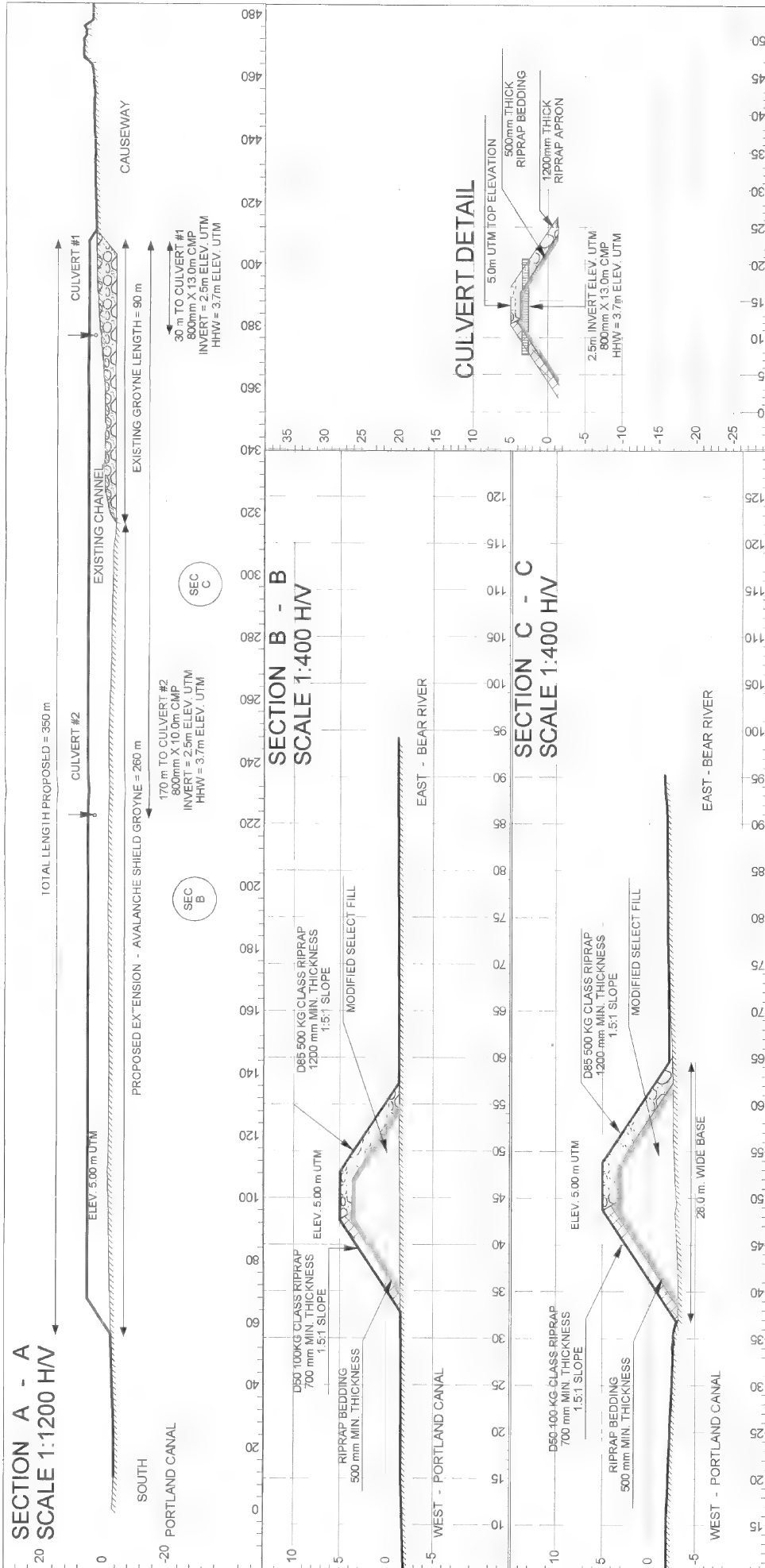
CAUTION: DRAWING SCALE MAY BE DISTORTED
FROM PRINTING. INTENDED FOR 11 X 17 PAPER.
DWG # : 2017-SWP-4-001.REV1
JANUARY 5, 2018



PDM Services Ltd.

PDM
Services Ltd

P.O.Box 419
New Hazelton BC
V0J 2J0
TEL: (250) 842-2256
KEVIN@PDMSERVINCANADA.COM



<p>prepared for:</p> <p>STEWART WORLD PORT 11421 Alaska Road Fort St. John, BC V1J 6N2</p>	<p>ATTACHMENT: SECTION VIEWS AVALANCHE SHIELD GROUPE STEWART BC</p>	<p>prepared by:</p> <p>PDM Services Ltd. P.O. Box 419 New Hazelton BC V0J 2J0 TEL: (250) 842-2256 KEVIN@PDMSERVICES.CA</p>
--	--	--



**Keystone
Environmental**
Knowledge-Driven Results

December 14, 2017

Ms. Boone Barber, R.P.Bio.
Fisheries Protection Biologist
Fisheries and Oceans Canada, Pacific Region
3190 Hammond Bay Road
Nanaimo, BC V9T 6N7

Dear Ms. Barber:

**Re: Response to FPP October 2017 Comments
Stewart World Port Facility Avalanche Shield Project
Stewart, BC
Project No. 12336, DFO File No. 17-HPAC-00206**

We have enclosed the report titled *Response to FPP October 2017 Comments, Stewart World Port Facility Avalanche Shield Project (DFO File No. 17-HPAC-00206)*. We are pleased to submit this report to the Fisheries Protection Program and look forward to advancing this file towards securing a *Fisheries Act* Authorization for the Avalanche shield.

If you have any questions, please do not hesitate to contact us.

Sincerely,

Keystone Environmental Ltd.

Warren Appleton, R.P.Bio
Senior Biologist

\\key-fs2012\Common\12300-12399\12336\Reports\12336 171214 DFO Response.docx

encl.

Suite 320
4400 Dominion Street
Burnaby, British Columbia
Canada V5G 4G3

Telephone: 604 430 0671
Facsimile: 604 430 0672
info@KeystoneEnviro.com
KeystoneEnviro.com

Environmental Consulting
Engineering Solutions
Assessment & Protection



**Keystone
Environmental**
Knowledge-Driven Results



***Response to FPP October 2017 Comments
Stewart World Port Facility Avalanche Shield
Project (DFO File No. 17-HPAC-00206)***

Stewart World Port Facility
Stewart, BC

Prepared for: Stewart World Port Ltd.

Project No.12336
December 2017

Environmental Consulting • Engineering Solutions • Environmental Planning

Suite 320
4400 Dominion Street
Burnaby, British Columbia
Canada V5G 4G3

Telephone: 604 430 0671
Facsimile: 604 430 0672
info@keystoneenvironmental.ca

EXECUTIVE SUMMARY

On behalf of Stewart World Port Ltd., Keystone Environmental Ltd. has prepared this response to questions raised by the Fisheries Protection Program in their letter dated October 26, 2017 regarding Stewart World Port's application for an Authorization to construct an avalanche shield at their facility in Stewart, BC (FPP File No. 17-HPAC-00206). The Fisheries Protection Program has determined the previous applications are incomplete until the requested questions are answered.

There is an immediate need to resolve the infilling of the boat basin by the Bear River at the Stewart World Port terminal. Recent bathymetry indicates Stewart World Port is out of time, and volume calculations indicate there will be extensive dredging required on a yearly basis if immediate action is not taken. There also remains a long-term risk to the facility related to the avalanche potential east of the site.

Keystone Environmental has addressed the majority of the comments in an aquatic effects assessment prepared by Keystone Environmental in December 2017, which includes a number of appendices (e.g. monitoring plan, design drawings). Keystone Environmental has also prepared a new offsetting plan (December 2017) to address the residual loss of gravel habitat at the mouth of the Bear River.

All remaining questions related to other projects no longer apply because those projects have been cancelled by Stewart World Port.

This Executive Summary is subject to the same general limitations as contained in the report and must be read in conjunction with the entire report.

TABLE OF CONTENTS

	Page
EXECUTIVE SUMMARY	i
1. SCHEDULE 1 SECTION 2: DESCRIPTION OF PROPOSED WORKS, UNDERTAKINGS OR ACTIVITIES.....	1
2. SCHEDULE 1 SECTION 3: DESCRIPTION OF PROPOSED WORKS, UNDERTAKINGS OR ACTIVITIES.....	2
3. SCHEDULE 1, SECTION 4, TIMELINE.....	2
4. SCHEDULE 1, SECTION 5, LOCATION	3
5. SCHEDULE 1, SECTION 7, DESCRIPTION OF FISH AND FISH HABITAT (AQUATIC ENVIRONMENT)	3
6. SCHEDULE 1, SECTION 9, 10, 11: MEASURES AND STANDARDS TO AVOID OR MITIGATE SERIOUS HARM TO FISH.....	6
7. SCHEDULE 1, SECTION 12: RESIDUAL SERIOUS HARM TO FISH.....	7
8. CONCLUSION	9
9. LIMITATIONS.....	9

1. SCHEDULE 1 SECTION 2: DESCRIPTION OF PROPOSED WORKS, UNDERTAKINGS OR ACTIVITIES

Questions from FPP and responses are provided below:

QUESTION #1

Clarify whether the existing riprap groyne is within the proposed design footprint or if portions of the existing structure (i.e. westerly hook) will be removed.

Response:

The majority of the riprap groyne is within the design footprint except for 192 m². See Figure 6 and 7 in the Aquatic Effects Assessment – Keystone Environmental, December 2017 (AEA). The portion that extends past the design footprint is 192 m² (i.e. “westerly hook”), and will be removed and converted back to pebble habitat if FPP agrees it can be subtracted from the pebble residual impact. Its removal is not required as part of the project.

QUESTION #2

Provide a description of the project of which the proposed work (i.e., avalanche shield) is a part (i.e., port facility). Include a summary, with estimated footprints (m²) of existing, proposed and future components of the project, including but not limited to gravel extraction in the Bear River, riparian clearing and levelling of land adjacent to the Bear River for development of upland laydown areas, estuarine infill for a laydown area adjacent to the proposed avalanche shield, marine dredging in the Bear River Estuary at your port facility and marine infilling for the purpose of a laydown area with barge landing/barge ramp in Marmot Bay.

Response:

The project description is provided in the AEA – Section 2. The description includes all the currently planned projects; any projects that DFO has referenced that are not included in the project description in Section 2 of the AEA are cancelled.

QUESTION #3

Provide clarity on the purpose of the proposed work (i.e., avalanche shield) as it is unclear whether it is for avalanche protection or for diversion of sediment and water away from your facility. Include the purpose of the overall project (i.e. port facility).

Response:

Project justification is provided in Section 1.2 of the AEA. The works are for both.

QUESTION #4

Provide test results of your construction material verifying that it is non-acid generating rock. If test results are not available, confirm that your construction material will be tested to verify that it is non-acid generating rock. Confirm that only non-acid generating rock will be used.

Response:

Only non-acid generating rock will be used, and it will be tested prior to construction, as stated in Section 4 of the AEA.

2. SCHEDULE 1 SECITON 3: DESCRIPTION OF PROPOSED WORKS, UNDERTAKINGS OR ACTIVITIES

QUESTION #5

Provide engineer drawings with material specifications of the proposed work. Include an overlay of the existing infrastructure (i.e. causeway, riprap groyne) with the proposed works. Include profile and plan view drawings with high and low water marks relative to chart datum. Profiles should include north-south and east-west cross sections. Multiple east-west sections should be provided along the length of the structure to show the existing infrastructure overlaid with the new infrastructure.

Response:

Engineered drawings are included in Appendix C of the AEA from a professional engineer. High water mark and low water marks are 0m and 7.6m chart datum and can be determined as stated in the drawing notes section. High and low water marks are shown on the general arrangement plan and section in the AEA Figures 2 and 3.

3. SCHEDULE 1, SECTION 4, TIMELINE

QUESTION #6

Provide a description of the anticipated phases, including the sequencing of phases of the proposed work (i.e., avalanche shield) and of the project (i.e. port facility). Include each schedule for carrying on the proposed work and the various components of your projects (as per Question 2).

Response:

A description is provided in the AEA Section 2. All other projects are cancelled.

4. SCHEDULE 1, SECTION 5, LOCATION

QUESTION #7

Please provide updated figures that reflect the current infrastructure (i.e. causeway, groyne, dock) as they do not show the current groyne configuration.

Response:

The location of the project is described in the AEA. A location map is provided as Figure 1 showing the general location, and a general arrangement plan is shown as Figure 2. The current groyne configuration is shown on the bathymetry, and is specifically outlined in the impact drawings of the AEA as Figure 6 and 7.

QUESTION #8

Provide a figure showing the overall port facility project, including all the project components referred to in Question 1.

Response:

All proposed works are shown on the general arrangement plan – Figure 2 of the AEA. All other projects are cancelled.

5. SCHEDULE 1, SECTION 7, DESCRIPTION OF FISH AND FISH HABITAT (AQUATIC ENVIRONMENT)

QUESTION #9

The Aquatic Effects Assessment included in your submission was written on May 26, 2016, prior to the construction of the emergency riprap groyne (16-HPAC-00732). Characterize and provide the areas (m²) of the different fish habitats (i.e. intertidal riprap, intertidal gravel) that are within the footprint of the proposed works that are reflective of the current site conditions (i.e., current riprap groyne configuration). Include fish species use and life stage, substrate type, vegetation colonization and area (m²).

Response:

This information is provided in the AEA – sections 2, 3 and 4. Areas are also shown on Figure 6 and 7 of the AEA.

QUESTION #10

In a table, clarify the pre- and post-construction conditions by habitat type and area (m²).

Response:

The pre and post habitat areas are shown in the AEA Drawings 6 (pre) and 7 (post) and summarized in a habitat balance sheet in Section 4.

QUESTION #11

Your September 1, 2017 response prepared by Keystone Environmental and PDM Services reference the following report, "NHC 2017. Stewart World Port Groyne Fluvial Geomorphic Monitoring Plan. Stewart World Port. 14pp". The Program has a September 2016 report prepared by this author of the same name. Clarify whether 2017 report referenced above is the same as the 2016 report the Program has. If not, please provide a copy of the 2017 report.

Response:

There was an error in the Keystone reference and it should have read "NHC 2016. Stewart World Port Groyne Fluvial Geomorphic Monitoring Plan. Stewart World Port. 14pp". The Program's reference to the 2016 report is correct and there is no 2017 report of the same name.

QUESTION #12

Your September 1, 2017 response prepared by Keystone Environmental and PDM Services appears to be based on studies conducted prior to the construction of the existing groyne. The June 2016 Northwest Hydraulic Consultants report titled, "World Port Groyne / Avalanche Protection Feature and Laydown Area – Geomorphic and Hydraulic Assessment" was prepared prior to the existing groyne being constructed; therefore, the current conditions of the site were not considered in this assessment. Provide rationale as to how the information and conclusions within the June 2016 Northwest Hydraulic Consultants assessment applies to the proposed works. Most appropriate, by providing a statement by the authors verifying the validity of the assessment as it relates to your current proposed works under current site conditions.

Response:

The assessment by NHC was conducted for the avalanche shield. The existing groyne is only temporary as the avalanche shield will be constructed on top of it. The presence of the existing groyne doesn't change the outcome of the NHC report because none of it will be sticking out beyond the avalanche shield.

Stewart World Port also provides the following response:

NHC has been conducting studies in the area for years for both the District of Stewart and Stewart World Port. DFO statement that NHC's report did not include the existing groyne is incorrect. Furthermore, modeling by NHC including studies conducted for the District of Stewart included discussion with Stewart World Port regarding the historic state of the site with the tenured groyne, without the tenured groyne, with the groyne that SWP removed, and considering the eventual construction of the groyne currently under application.

The groyne under current application is clearly depicted in Figure 2, pg. 3; Figure 5, pg. 10; Figure 8, pg. 15; and Figure 15, pg. 23 of "World Port groyne/avalanche protection feature and laydown area Geomorphic and hydraulic assessment" authored by NHC a copy of which is in the Program's possession. This report, and the other 344 pages of studies and modeling also provided to the Program clearly conclude:

- "The Project is not expected to alter the design flood levels, defined as the 200-year instantaneous discharge with a coincident HHW mean tide, and 0.8m storm surge." (World Port groyne/avalanche protection feature and laydown area Geomorphic and hydraulic assessment" pg. 23)
- "Groundwater levels in town are not expected to be affected." (World Port groyne/avalanche protection feature and laydown area Geomorphic and hydraulic assessment" pg. 24)
- The existence of the groyne under application, will serve only to protect SWP workers and the environment (by removing the necessity for dredging the SWP wharf face) and will not alter the historic growth patterns of the delta, increase the flood threat, or impact the estuary due to the action of ongoing tidal flushing. (As proven in the 344 pages of studies and modeling as well as SWP's ongoing monitoring program surveys).

QUESTION #13

Update your September 1, 2017 response to include detailed references and calculations as to how you determined the 70 m²/year effects to the Mouth of the Bear River (Section 2.3, 3.2, 3.4 and 4 of the document).

Response:

$$\begin{aligned}\text{Volume Retained} &= (4.7 \times 145 \times 27) + (4.6 \times 158 \times 42) + (5.9 \times 165 \times 55) + (8.7 \times 200 \times 55) \\ &= 198,168.6 \text{ m}^3 \text{ per year}\end{aligned}$$

$$\begin{aligned}\text{Volume to West} &= (4.7 \times 145 \times 27) + (4.6 \times 158 \times 42) \\ &= 48,926.1 \text{ m}^3 \text{ per year}\end{aligned}$$

$$\begin{aligned}\text{Current Area of Advancement} &= (4.7 \times 145) + (4.6 \times 158) + (5.9 \times 165) + (8.7 \times 200) \\ &= 4,121.8 \text{ m}^2 \text{ per year}\end{aligned}$$

$$\text{Extra Advancement to South} = 48,926.1 / 55 = 2.44 \text{ m south per year}$$

$$\text{The total advancement} = 2.44 + 8.7 = 11.1 \text{ m south per year}$$

$$\text{Area After Avalanche Shield} = 11.1 \times 365 = 4,051.5 \text{ m}^2$$

$$\text{Net change} = 4,051.5 - 4,121.8 = -70.3 \text{ m}^2 \text{ per year.}$$

6. SCHEDULE 1, SECTION 9, 10, 11: MEASURES AND STANDARDS TO AVOID OR MITIGATE SERIOUS HARM TO FISH

QUESTION #14

Describe the mitigation measures that will be employed to avoid the death of fish during works (e.g. fish stranding within infill areas after the tide recedes).

Response:

Mitigation measures are provided in the AEA Section 4.

QUESTION #15

Provide a monitoring plan and schedule that includes the following: monitoring of the work area (i.e. infill) after tidal inundation to evaluate and record fish stranding and /or mortality (including evenings, weekends or times when works are not being undertaken). Please include a reporting protocol consistent with Section 38(4) of the Fisheries Act regarding the duty to report serious harm to fish.

Response:

A monitoring plan is provided in the AEA – Appendix 2.

QUESTION #16

Provide a fish salvage plan that will include pre-construction (i.e., prior to infilling) fish salvage and in the event of fish stranding during works.

Response:

Fish salvaging is described as part of the mitigation measures in the AEA Section 4.

QUESTION #17

Provide details on how you will assess the effectiveness of sediment and erosion control mitigation measures and standards including, but not limited to: a) frequency and schedule for monitoring total suspended solids (TSS) and turbidity, sampling methods, water quality sample location and depths, water quality guidelines, including areas where water quality compliance is to be met. B: the methods of how you propose to install the silt curtain on site and the environmental conditions necessary for it to function as designed. C) a figure showing the location of the silt curtain and water quality sample locations. D) a reporting protocol consistent with Section 38(5) of the Fisheries Act regarding the duty to report the deposit of deleterious substances into waters frequented by fish.

Response:

This information is provided in Section 4 of the AEA and includes Figure 8.

QUESTION #18

Clarify whether the qualified environmental monitor(s) will be monitoring all works below the high water mark. If full time environmental monitoring is not proposed, provide rationale to support the level of construction environmental monitoring (i.e. presence of qualified environmental monitor).

Response:

Yes, all works will be monitored full time.

QUESTION #19

Provide a mitigation contingency plan. This plan should address events such as (but not limited to) fish entrapment and stranding, marine mammal presence in the work site, erosion and sediment control failures and sediment events.

Response:

Marine mammal monitoring plan and eulachon monitoring plans are included as appendices in the AEA to address these issues, if they were to occur.

7. SCHEDULE 1, SECTION 12: RESIDUAL SERIOUS HARM TO FISH

QUESTION #20

Your characterization of the direct habitat impacts expected to result from the proposed works is not reflective of the Program's determination. Based on the information you provided, the Program anticipates the residual serious harm to fish as a result of your proposed works will include the destruction of 4688 m² of intertidal gravels within the direct footprint of the works (i.e. gravels that will be converted to riprap and high water and gravels converted to intertidal riprap slope. Please update your residual serious harm to fish determination (including applicable tables) as required in consideration of item 20, as well as any changes to your submission.

Response:

The direct habitat impacts are described in the AEA. Residual harm as defined by the Program was used.

QUESTION #21

Provide a Monitoring Plan that will detect potential channel and estuary changes, such as, aggradation/degradation of the bed, planform changes of the channel in the Lower Bear River and Bear River Estuary, changes in sediment deposition, flow patterns and primary productivity in the Bear River Estuary. This plan should include assessment of the biological and physical conditions, with adequate accuracy and detail to determine indirect serious harm to fish outside the footprint area of the works. This plan must be prepared by qualified professionals with relevant expertise, preferably including experience with the Lower Bear River and Estuary, and it is strongly recommended that it be developed in consultation with DFO and Provincial agencies.

Response:

The following response was provided by SWP:

NHC has been conducting studies in the area for years for both the District of Stewart and Stewart World Port. DFO statement that NHC's report did not include the existing groyne is incorrect. Furthermore, modeling by NHC including studies conducted for the District of Stewart included discussion with Stewart World Port regarding the historic state of the site with the tenured groyne, without the tenured groyne, with the groyne that SWP removed, and considering the eventual construction of the groyne currently under application.

The groyne under current application is clearly depicted in Figure 2, pg. 3; Figure 5, pg. 10; Figure 8, pg. 15; and Figure 15, pg. 23 of "World Port groyne/avalanche protection feature and laydown area Geomorphic and hydraulic assessment" authored by NHC a copy of which is in the Program's possession. This report, and the other 344 pages of studies and modeling also provided to the Program clearly concludes:

- "The Project is not expected to alter the design flood levels, defined as the 200-year instantaneous discharge with a coincident HHW mean tide, and 0.8m storm surge." (World Port groyne/avalanche protection feature and laydown area Geomorphic and hydraulic assessment" pg. 23)
- "Groundwater levels in town are not expected to be affected." (World Port groyne/avalanche protection feature and laydown area Geomorphic and hydraulic assessment" pg. 24)
- The existence of the groyne under application, will serve only to protect SWP workers and the environment (by removing the necessity for dredging the SWP wharf face) and will not alter the historic growth patterns of the delta, increase the flood threat, or impact the estuary due to the action of ongoing tidal flushing. (As proven in the 344 pages of studies and modeling as well as SWP's ongoing monitoring program surveys).

QUESTION #22

You notified the program on October 6, 2017 that the Parcel B offset measures proposed as part of your application for authorization were constructed in their entirety in the spring of 2017. These measures were constructed prior to formal review by the Program and issuance of a

Fisheries Act authorization. The Program understands that this was a construction error; however, the Program is not able to accept pre-built offset measures. Based on this decision: a) provide an Offsetting Plan that meets the information requirements set out in the Application for Authorization under Paragraph 35(2)(b) of the Fisheries Act Regulations and meets the Program's Fisheries Productivity Investment Policy b) Provide an irrevocable letter of credit to cover the cost of the implementation of the offsetting plan, including construction, monitoring and reporting, if you are required to provide one as set out in subsection 3(2) of the Regulations.

Response:

Keystone Environmental has prepared a new offsetting plan for additional offsetting works to be conducted. Included in the offsetting plan is letter of credit cost estimates for DFO review. A letter of credit will be provided once DFO approves the new offsetting plan.

8. CONCLUSION

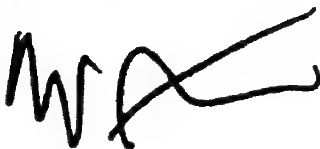
Keystone Environmental trusts the information submitted meets the requirements of FPP. Please confirm if the application for an Authorization is complete.

9. LIMITATIONS

This report has been prepared solely for the internal use of Stewart World Port Ltd. and Fisheries and Oceans Canada, pursuant to the agreement between Keystone Environmental Ltd. and Stewart World Port Ltd. By using this report, Stewart World Port Ltd. and Fisheries and Oceans Canada agree that they will review and use the report in its entirety. Any use which other parties make of this report, or any reliance on or decisions made based on it, are the responsibility of such parties. Keystone Environmental Ltd. accepts no responsibility for damages, if any, suffered by other parties as a result of decisions made or actions based on this report.

December 14, 2017
Date

Prepared by:



Warren Appleton, B.Sc., R.P.Bio
Senior Biologist



Licence Number: XHAB 48 2018
Valid From: 15-Apr-2018
Expiry Date: 14-Apr-2019

This licence and/or permit is issued under the authority of SECTION 52 OF THE FISHERY (GENERAL) REGULATIONS.

This licence and/or permit authorizes the person(s) listed below, subject to the following terms and conditions, to collect the species and quantity of fish identified below for: Scientific purposes. Non-compliance with any condition of this licence and/or permit may result in the cancellation of this licence and/or permit.

Licence/Permit Activity Description:

Stewart World Port is planning the construction of an avalanche shield at their facility at the south end of Main Street in Stewart, BC. Keystone Environmental has been retained by Stewart World Port to plan and implement an offsetting plan for the proposed works. The location of the proposed enhancement is along the southeast corner of the Stewart airport, between an area called Parcel A (Authorization 12-HPAC-PA4-00248 and 16-HPAC-00732) and the Bear River. The area is currently a seasonal drainage that is dry prior to the Bear River freshet. The existing habitat is primarily ephemeral consolidated gravel with no vegetation or undercut banks and a lack of deep permanent pools or marsh vegetation.

Isolation of the enhancement area and fish salvage will need to be completed prior to dewatering and in stream works. Isolation of the work areas will use exclusion netting and silt fencing. The inlet of pumps will be screened and prevent fish entrainment and hose outlets will be secured and protected with boulders or equivalent to diffuse discharge and prevent scour. Methods of collection will include minnow trapping, seine netting, dip netting and electrofishing. Fish trapped as part of salvage will be briefly detained for identification and released upstream (northeast) into Bear River side channel habitat. If flow levels are insufficient in upstream habitat at time of salvage, individuals will be released into the Bear River mainstream (east). Fish will be held temporarily in clear buckets containing cold stream water before transfer to the stream outside of the isolation area. If required, an aquarium bubbler will be used to aerate water within the buckets.

The fish salvage work will be completed by Keystone Environmental Ltd. in partnership with the Nisga'a First Nations. The work will be conducted by a team of two or three people. Keystone Environmental staff included in fish sampling.

Licence Holder:
FIN: 121981
320-4400 DOMINION ST.
BURNABY BC V5G 4G3

KEYSTONE ENVIRONMENTAL LTD

Contact Number: 604-430-0671
Fax Number: 604-430-0672

Contact Party:

FIN: [REDACTED] BYRNE, SHANE ARLEN BRADY

Contact Number: [REDACTED]

Individuals or groups assisting with the authorized activity:

All Keystone Environmental Employees and Nisga'a Lisims Government Employees are authorized under this licence.

Species, Quantity of Fish, Area(s) and Gear:

Species: SALMONIDS (Salmonidae)
Gear: Trap, Gee/Minnow
Dip Net
Seine Net
Electroshocker

Licence Area: Stewart, BC South east end of Stewart airport; Bear River Estuary

To be 0
Retained:

Reporting Requirements:

XHAB 48 2018

Due Date 31-May-19

Terms and Conditions:

This licence authorizes collections to be made by the licensee and employees, volunteers and students of the licensee provided that all persons, other than minors who are engaged in activities under the authority of this licence, are carrying suitable photo identification to be produced upon request of any fishery officer or fishery guardian.

Prior to sampling and upon completion of any fishing activities the local Fishery Officers of the Department of Fisheries and Oceans must be informed of the exact time, location, purpose and samplers. All fish mortalities resulting from sampling activities must be reported.

All specimens must be released unharmed into the water body or course from which they originated and as near as possible to the location from which they were captured.

4. It is the responsibility of the licence holder to ensure that samplers are experienced and competent in the fish collection methods authorized in this licence.

Electrofishing is not permitted in the vicinity of spawning salmon or redds. Electrofishing can be severely damaging to eggs and alevins and must be avoided where eggs and alevins may be present. A trained and certified electrofisher operator must be a part of the electrofishing crew. Electroshocking is not permitted in water with a temperature below 5 degrees Celsius.

Contact Province of BC for a licence to collect non-salmon species.

All gear left unattended must be clearly labelled with the Licence Number and must not interfere with the public right of navigation.

This licence may be amended or revoked by the Department prior to the expiry date if deemed necessary.

A breach of licence conditions is a Fisheries Act offence.

Section 32 (1) of the federal Species at Risk Act prohibits killing, harming, harassing, capturing or taking an individual of a wildlife species which is listed on Schedule 1 as an extirpated species, an endangered species or a threatened species. Refer to the SARA Public Registry at <http://www.sararegistry.gc.ca> to determine if species at risk may be in your research area and to apply for a permit if required.

Reporting Requirements

A written report describing dates of collection, location, DFO statistical management area and subarea, scientific

Licence Number: XHAB 48 2018
Valid From: 15-Apr-2018
Expiry Date: 14-Apr-2019

name, common name and numbers of organisms or weight in kg. If numbers is an inappropriate measure, is required to be submitted to DFO within 30 days following expiration of this licence.

This licence requires submission of a final report to be sent electronically to DFO.NCSP-PSCN.MPO@dfo-mpo.gc.ca

Refer to the reporting requirements on this licence for due date.

Please refer to the scientific licence number when submitting report.

By signing on this document, the person(s) listed below, agree to be bound by the terms and conditions that pertain to each person as an individual and to the group as a whole.

121981

FIN	Licence Holder - Print Name	Signature	Date
-----	-----------------------------	-----------	------

Licence Issued: 11 April 2018

Licence Printed: 11 April 2018

Licence Issued By: CHERA WHEELDON, Fisheries and Oceans Canada

16 of 7

Sep 24/68 W/AM

Steward world Port

MT-HPAC - 00206

16-HPAC - 00732

12-HPAC - PA4-024B

Parcel A → Dry on ~~road~~ East
Side of culvert west
→ flow on ~~main~~ side
appears to be from ground
- pond w/ LND wetted
(Parcel B)

MT1 4:34pm (side channel)
MT2 4:35pm (mouth of side channel)
MT3 4:38pm (in 123rd of Parcel B)
MT4 4:38- (end of LND)
in Parcel B

K. B. R. R.

2007

Sep 25/10

vu / par

grape inspector

Range finder length.

stop distance. Total height 333 m

(SD) North side slope - 10.7m (-32.20)

(SD) South side slope - 8.6m (-39.50)

Notes.

- good growth on rocks

→ Scon's stable

→ measurement approx 15m in.

End of grape (height = 333m)

North - 10.1m (-35.8)

South - 10.0m (-40.5)

Sep 25/18

VM/AM

3 of 7

(12 HPAC - PM - 00248)

Causeway Refuge habitat inspection

→ South west side of

Causeway has small substrate

sizes: ∴ limited growth

of fucus.

- consistent w/ 4 report

(see photo) #19

→ Some attached fucus

in low area on smaller

embedded rock.

→ Photo #21 → better

growth toward pad of

causeway near wharf.

- large Rock substrate

- fucus; green algae

- some mussel growth

- 3 river otter (2 on d

causeway near wharf

- fishing.

Return when

Sept 25/18 VM/AM 4 of 7

* both coverage a fl.
east side (lucas/green)

- Substrate sizes much larger
on the east side of causeway
- more fence growth.

Minnow trap retrieval.

NT 1 (9.45am)

TSB	78	Chin	94
COHO	62	COHO	78
COHO	84	COHO	82
COHO	48	TSB	59
* Dolly	96	COHO	73
Chin	112	COHO	48
COHO	66	COHO	59
Chin	78	COHO	81
TSB	51	COHO	74
COHO	77	COHO	84
COHO	80	COHO	66
COHO	83	COHO	72
		COHO	91

MT1 (cont'd)		Sept 25/18	5 of 7
IO	L	VM/AM	
19	COHO - 79	COG - 75	
20	COHO - 64	CCG - 62	
21	COHO - 69	CCG - 75	
22	COHO - 93		
23	COHO - 80		
24	COHO - 80		
25	COHO - 65		
	COHO 1111		
<hr/>			
MT2 (10:02 am)			
COHO -	1111 1111 1111 1111 1111		
	1111 11		
<hr/>			
MT3 (10:12 am)		COHO	
IO	L	1111 1111	
Chin -	93	1111 1111	
Chin -	106	1111	
Chin -	106	TSB - 61 (P. 10)	
Chin -	126	TSB - 60	
Chin -	89	CCG - 89	

Sept 25/18 VHL/AM 6 of 7

MT4	(10:24h)	COHO
20	L	-HIT
Chin	- 118	11
Chin	- 84	
OCF	- 88	

Salt Marsh inspection

- varied figure in report
- greese grazing
- Substrate in "poor" area mostly due to poorer substrate
- no compaction
- anoxic
- Silt ratio high

s.19(1)

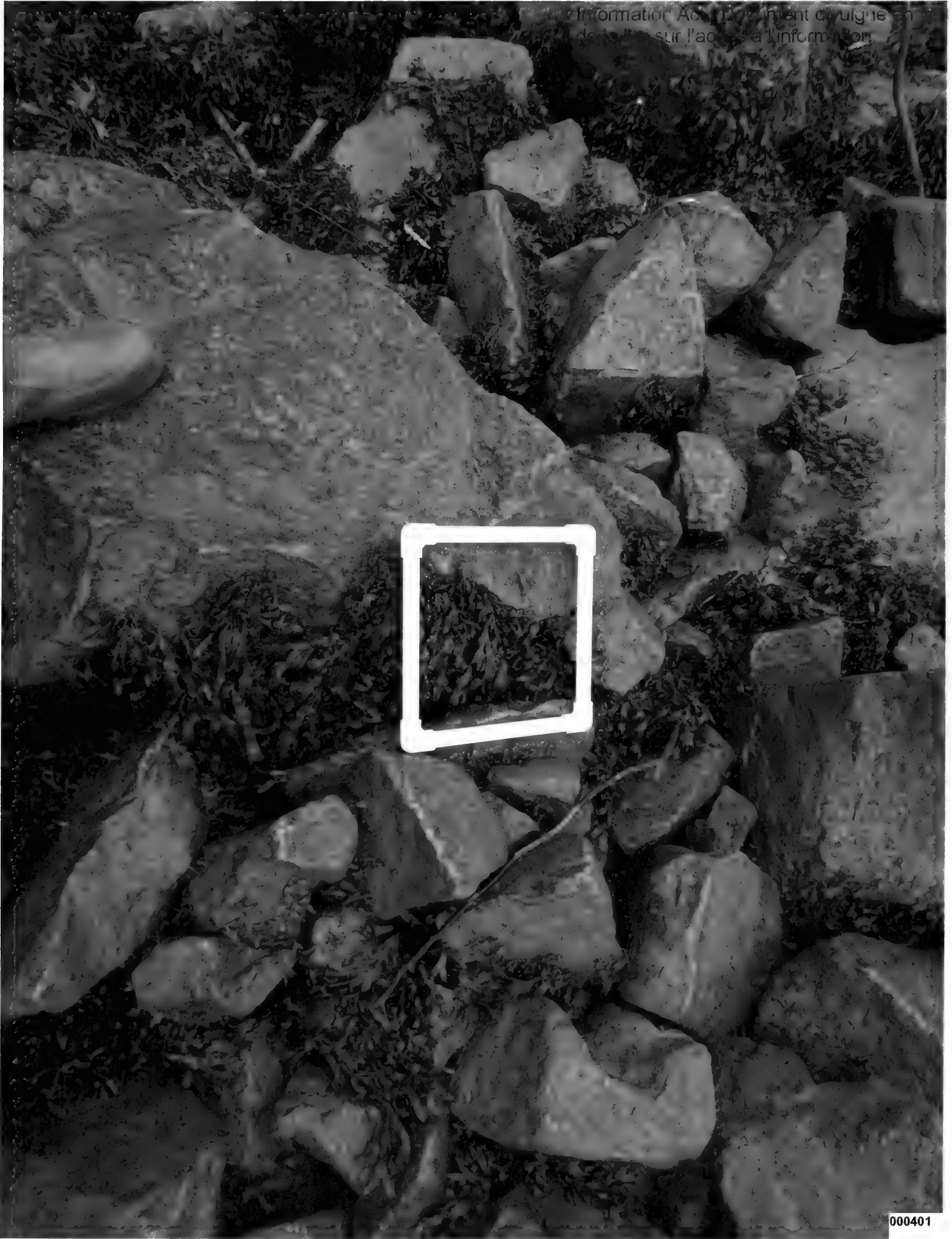
000399

Sept 25/18 vmyan 7/05-7
(SCP) - interst "16"
members of Cotto
in office
1st upper part Ctk.
- 1st wooden
offsetting works / pasport
works by Beebe removed
- clearing flows in
Ctk for Cotto pop

END of trip.

Rat. m. h. m.









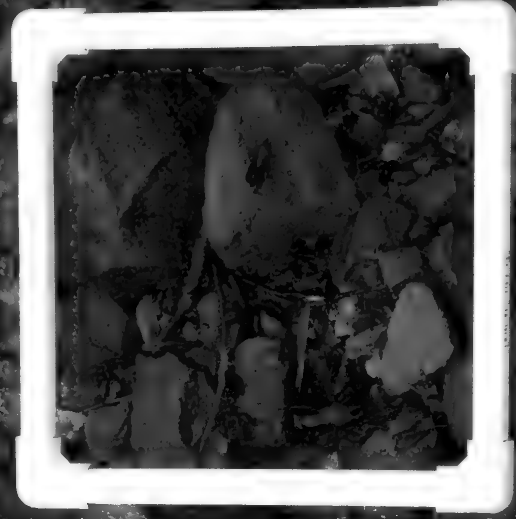


CCG - 88

Salt Marsh

inspecho

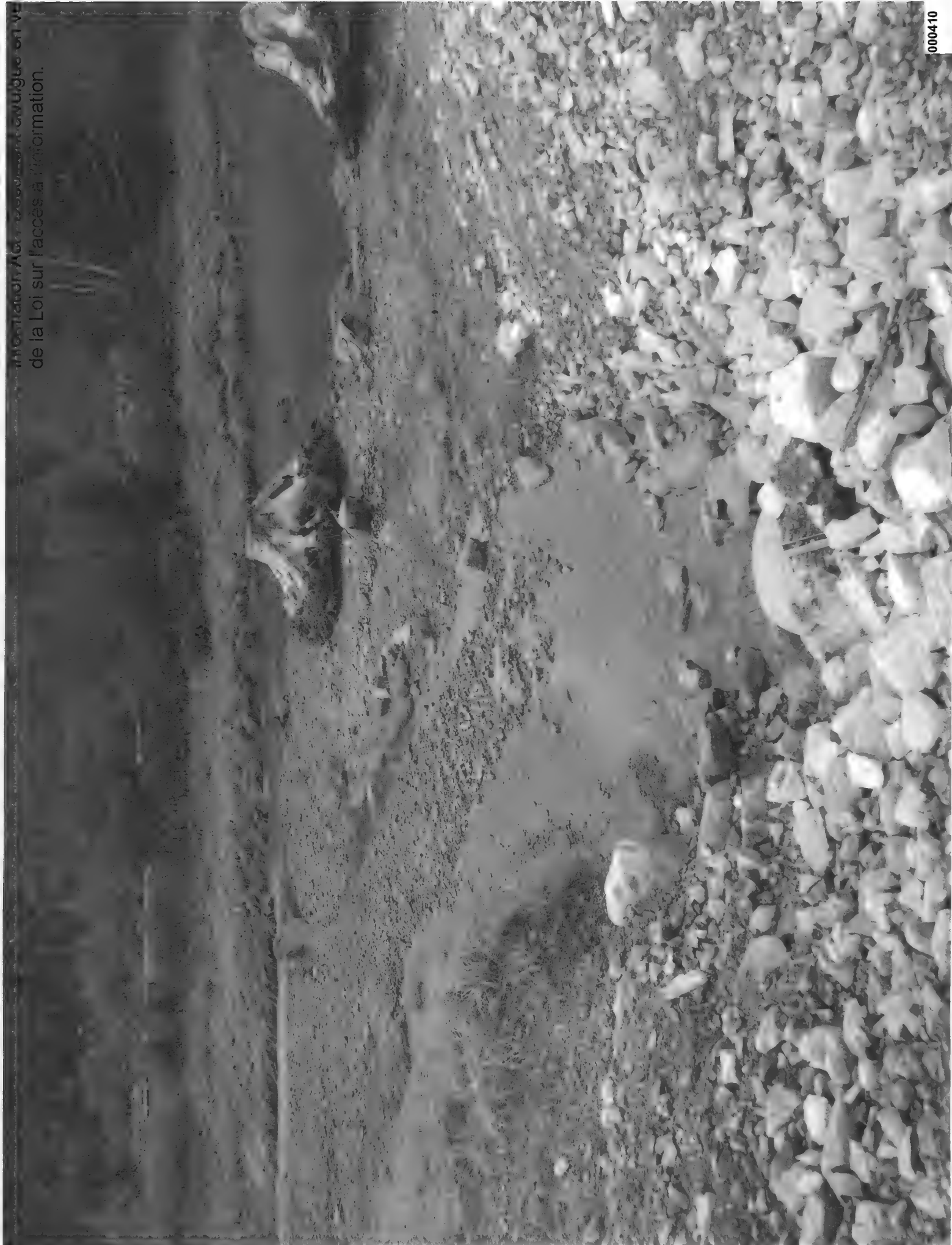




September 25, 2018 Site Visit

Purpose: Look at Parcel B following monitoring report.

Photo #	Description
DSCN0001	West side of culvert looking across stream
DSCN0002	West side of culvert looking upstream
DSCN0003	East side of culvert (parcel A)
DSCN0004	East side of culvert (facing east) parcel A
DSCN0005	Looking thorough the culvert
DSCN0006 to 13	Parcel B
DSCN0025 to 39	Examples of fish caught in MTs (approx.. 12hr soak)



























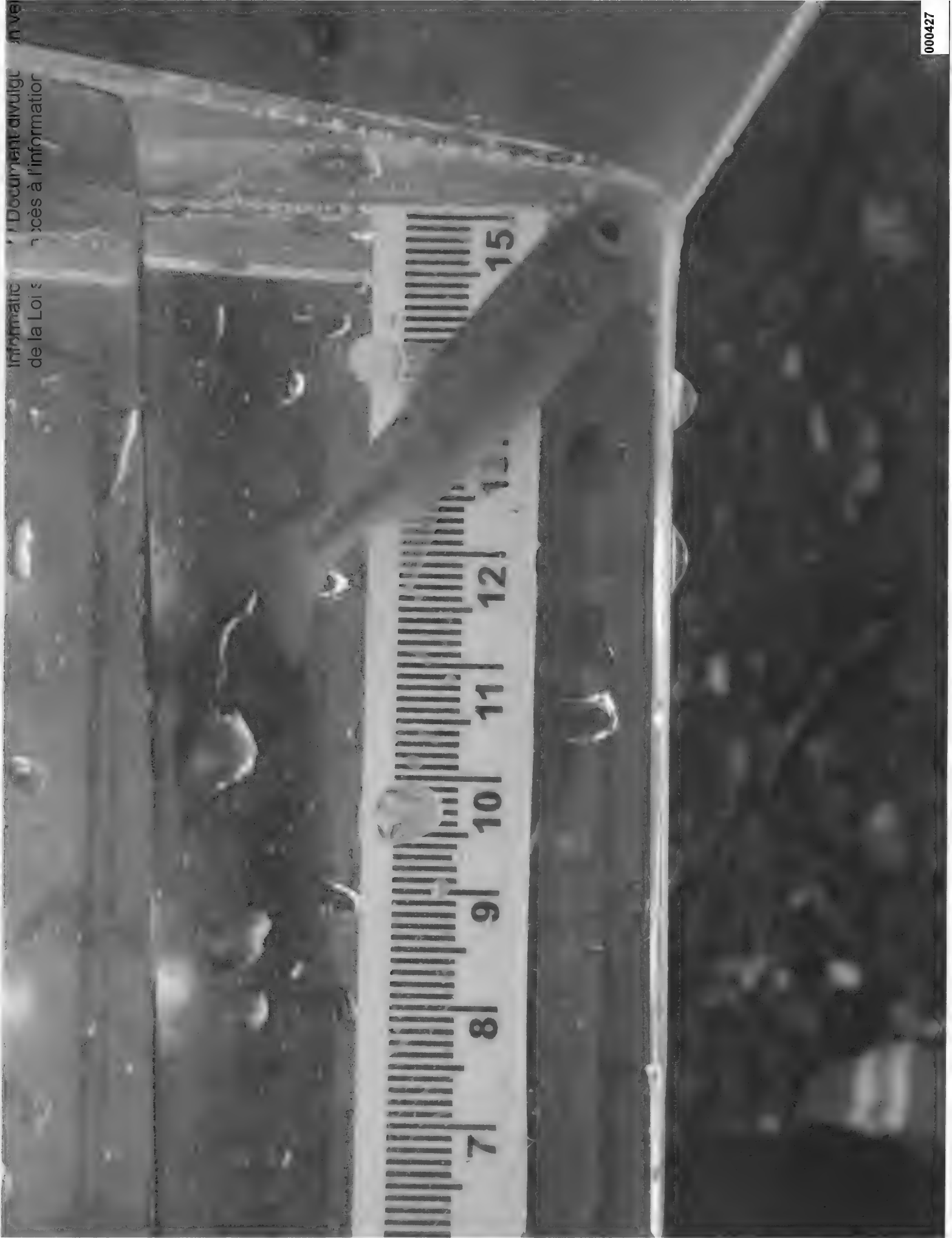




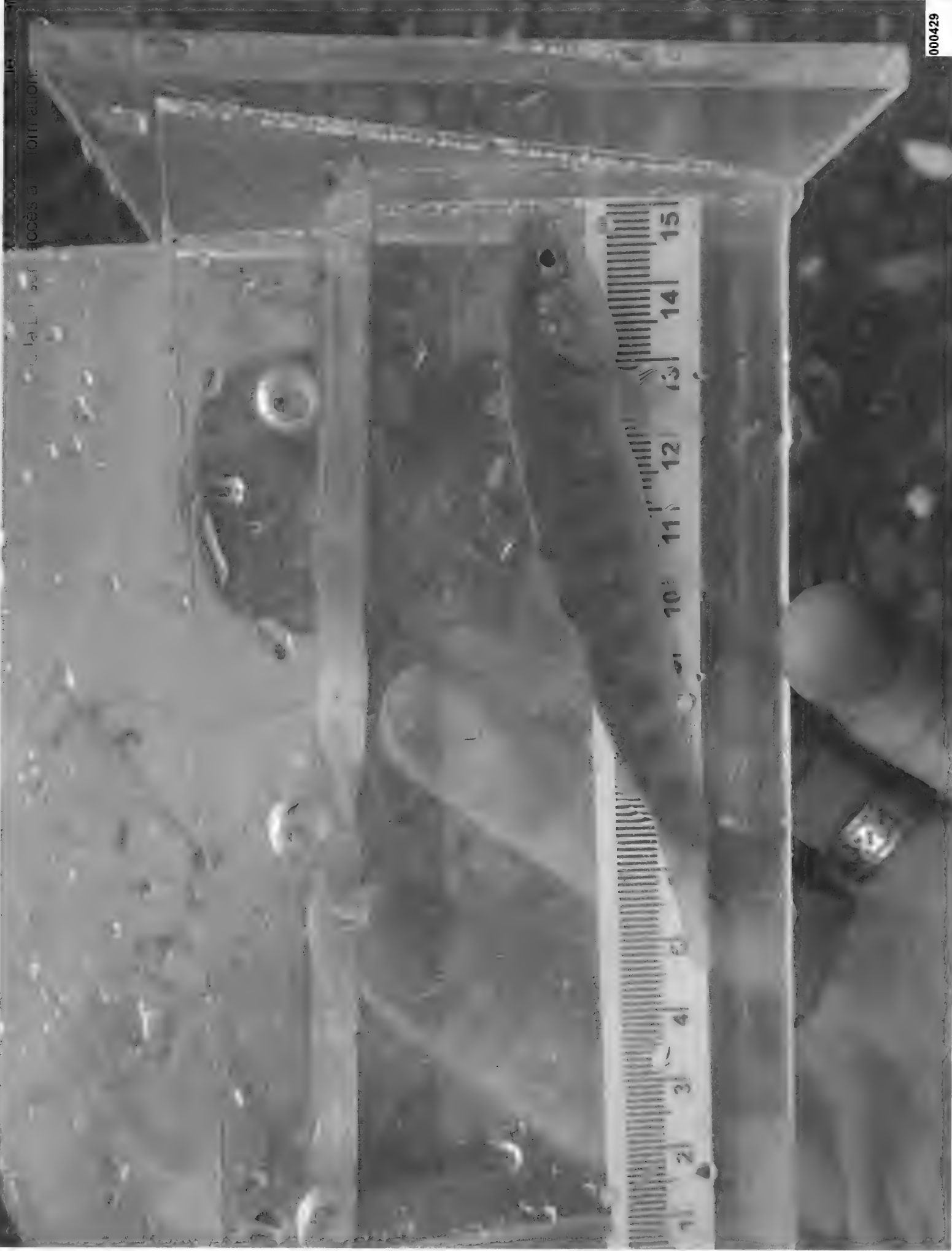
Minnow trap John

NT 1 (9:45 am)













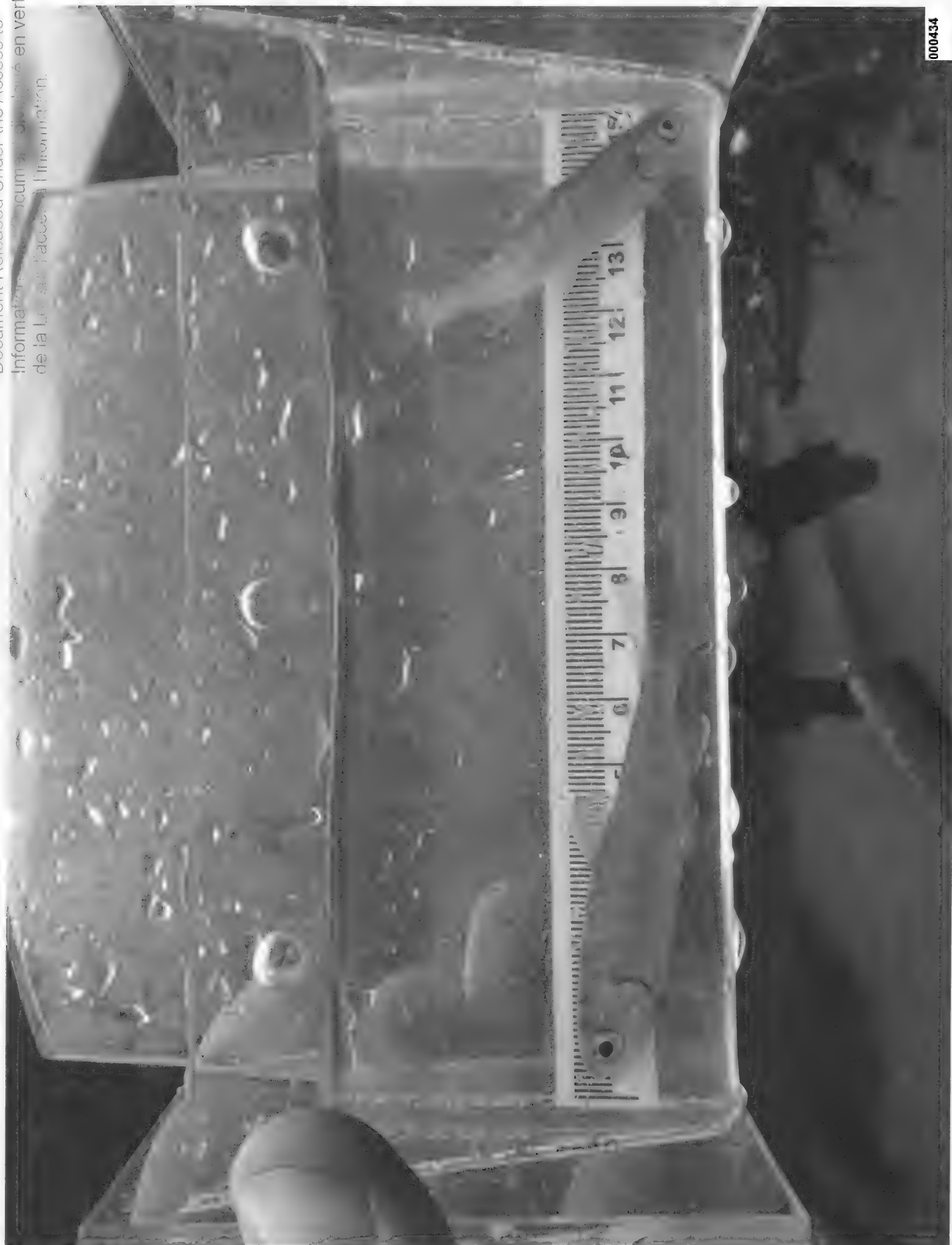


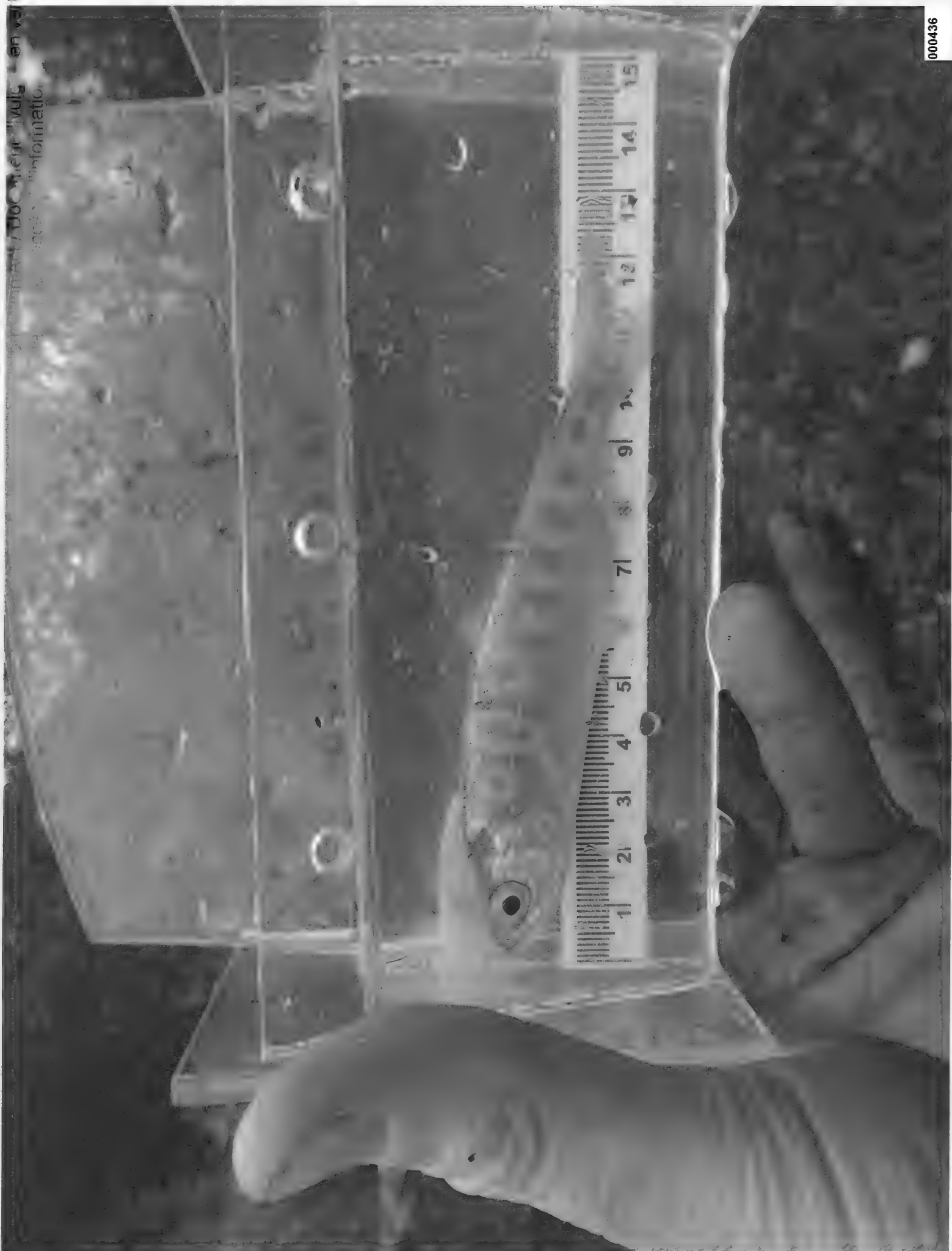
25 COHO-65

COHO 1111

MTZ (10:03 am)

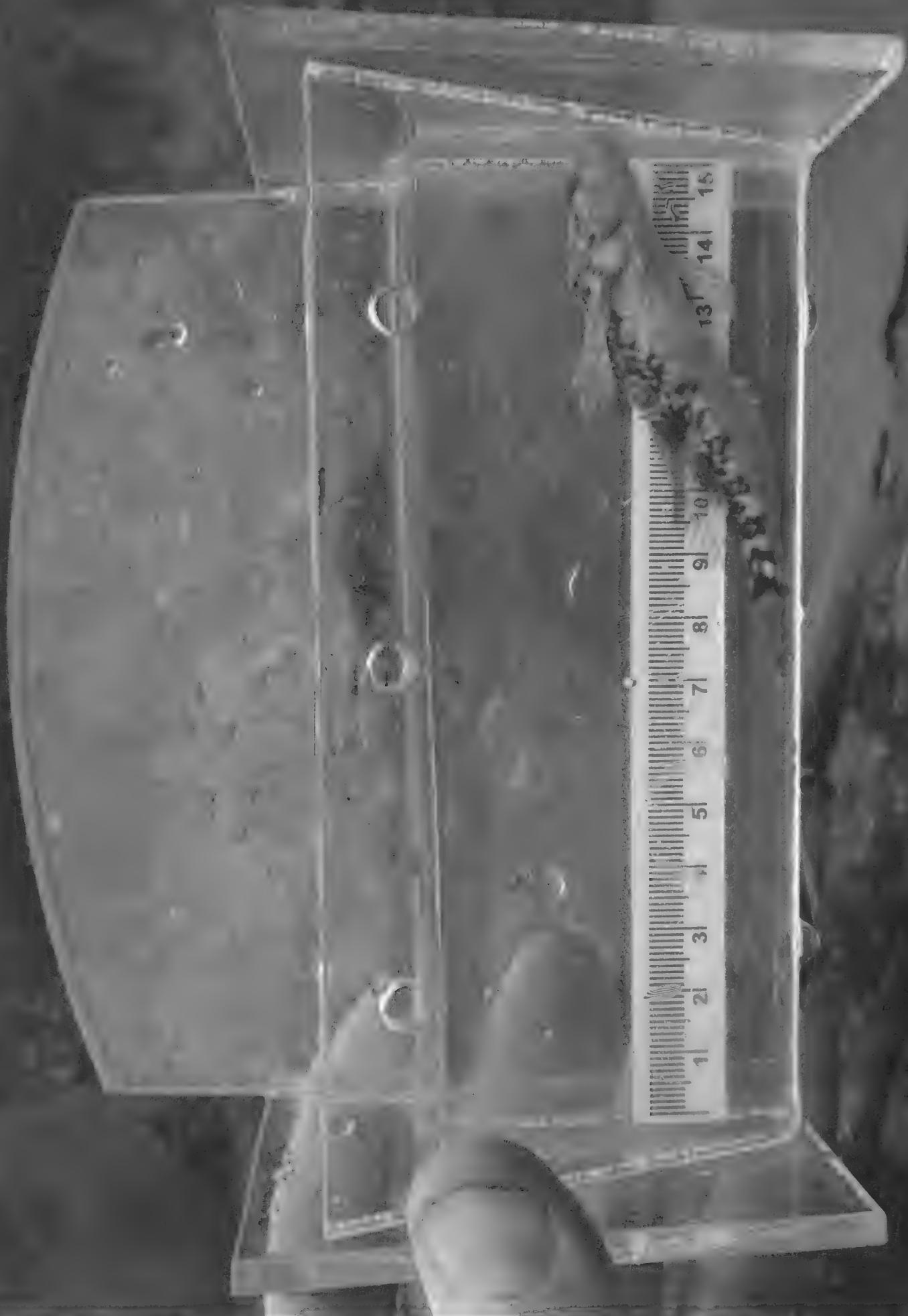
COHO-1111







MT4 (10:24)





Licence Number: XHAB 254 2018

Valid From: 27-Nov-2018

Expiry Date: 31-Dec-2018

This licence and/or permit is issued under the authority of SECTION 52 OF THE FISHERY (GENERAL) REGULATIONS.

This licence and/or permit authorizes the person(s) listed below, subject to the following terms and conditions, to collect the species and quantity of fish identified below for Scientific purposes. Non-compliance with any condition of this licence and/or permit may result in the cancellation of this licence and/or permit.

Licence/Permit Activity Description:

Fry salvaging prior to construction of the Stewart World Port Fish Habitat Enhancement Project. Site will be isolated and fish will be captured using minnow traps then released unharmed outside the work area. All fish will be enumerated by species and measured for fork length. All data will be submitted to DFO after completion.
NON-RETENTION ONLY

Licence Holder:

FIN: 144064

214 COMEAU RD
HAZELTON BC V0J 2J1**Contact Party:**

FIN: [REDACTED]

MCCARTHY, MICHAEL

KAM RIVER ENVIRONMENTAL
SERVICE

Contact Number: 778-202-8458

Contact Number: [REDACTED]

Species, Quantity of Fish, Area(s) and Gear:**Species:** SALMONIDS (Salmonidae)**Life Stage:** Fry**Gear:** Trap, Gee/Minnow**Licence Area:** Stewart, BC**To be** 0**Retained:****Reporting Requirements:**

XHAB 254 2018

Due Date 31-Jan-19

Terms and Conditions:

This licence authorizes collections to be made by the licensee and employees, volunteers and students of the licensee provided that all persons, other than minors who are engaged in activities under the authority of this licence, are carrying suitable photo identification to be produced upon request of any fishery officer or fishery guardian.

A breach of licence conditions is a Fisheries Act offence.

Prior to sampling and upon completion of any fishing activities the local Fishery Officers of the Department of Fisheries

and Oceans must be informed of the exact time, location, purpose and samplers. All fish mortalities resulting from sampling activities must be reported.

Copies of this licence must accompany the collecting personnel, be on board any collecting vessel and be carried by the transport vehicle at all times during collection and transport of samples. The licence must be produced upon the request of a Fishery Officer or Guardian.

4. It is the responsibility of the licence holder to ensure that samplers are experienced and competent in the fish collection methods authorized in this licence.

All gear left unattended must be clearly labelled with the Licence Number and must not interfere with the public right of navigation.

Release of fish: All non-target fish must be released unharmed into the water body or course from which they originated and as near as possible to the location from which they were captured.

9. This licence may be amended or revoked by the Department prior to the expiry date if deemed necessary.

8. Section 32 (1) of the federal Species at Risk Act prohibits killing, harming, harassing, capturing or taking an individual of a wildlife species which is listed on Schedule 1 as an extirpated species, an endangered species or a threatened species. Refer to the SARA Public Registry at <http://www.sararegistry.gc.ca> to determine if species at risk may be in your research area and to apply for a permit if required.

Contact Province of BC for a licence to collect non-salmon species (including steelhead and cutthroat smolts)

Provincial licence requirement

Contact Province of BC (Ministry of Forests, Lands and Natural Resources) for a scientific licence to collect non-salmon species (including rainbow and cutthroat trout).

Reporting Requirements

A written report describing dates of collection, location, DFO statistical management area and subarea, latitude and longitude, scientific name, common name and numbers of organisms or weight in kg, if numbers is an inappropriate measure, is required to be submitted to DFO within 30 days following expiration of this licence.

This licence requires submission of a final report to be sent electronically to DFO.NCSP-PSCN.MPO@dfo-mpo.gc.ca.

Refer to the reporting requirements on this licence for due date.

Please refer to the scientific licence number when submitting report.

Licence Number: XHAB 254 2018
Valid From: 27-Nov-2018
Expiry Date: 31-Dec-2018

By signing on this document, the person(s) listed below, agree to be bound by the terms and conditions that pertain to each person as an individual and to the group as a whole.

144004			
FIN	Licence Holder - Print Name	Signature	Date

Licence Issued: 13 December 2018

Licence Printed: 13 December 2018
Licence Issued By: CHERA WHEELDON, Fisheries and Oceans Canada



Fisheries and Oceans
Canada Pêches et Océans
CanadaLicence Number: XR 271 2019
Valid From: 12-Aug-2019
Expiry Date: 11-Aug-2020

This licence and/or permit is issued under the authority of SECTION 52 OF THE FISHERY (GENERAL) REGULATIONS.

This licence and/or permit authorizes the person(s) listed below, subject to the following terms and conditions, to collect the species and quantity of fish identified below for Scientific purposes. Non-compliance with any condition of this licence and/or permit may result in the cancellation of this licence and/or permit.

Licence/Permit Activity Description:**NON-RETENTION ONLY**

Stewart World Port constructed an avalanche shield at their facility at the south end of Main Street in Stewart, BC (Authorization 17-HPAC-00206). The authorization was submitted by Stewart World Port and were reviewed by Nisga'a First Nations during the Authorization approval process. Keystone Environmental has been retained by Stewart World Port to complete the year 1 effectiveness monitoring for the habitat offsetting for authorization 17-HPAC-00206. Fish sampling will take place in the offsetting habitat as well as at two reference locations. The first location is located upstream of the offsetting (55°56'5.98"N, 129°58'45.75"W) and the second is on a nearby watercourse (55°55'56.55"N, 129°58'14.16"W).

Licence Holder:FIN: 121981
320-4400 DOMINION ST.
BURNABY BC V5G 4G3

KEYSTONE ENVIRONMENTAL LTD

Contact Number: 604-430-0671
Fax Number: 604-430-0672**Contact Party:**

FIN: [REDACTED]

BYRNE, SHANE ARLEN BRADY

Contact Number: [REDACTED]

Individuals or groups assisting with the authorized activity:

Keystone Environmental employees that may complete fish sampling include Barry Warren, Shane Byrne, Krista Morden, Stephanie Davis, Corrie Allen, Emily West, and Dave Langill.

Species, Quantity of Fish, Area(s) and Gear:

Species:	SALMONIDS (Salmonidae)
Gear:	Trap, Gee/Minnow Dip Net Seine Net
Licence Area:	Bear River Estuary, Stewart BC.
To be Retained:	0

Licence Number: XR 271 2019
Valid From: 12-Aug-2019
Expiry Date: 11-Aug-2020

Additional Descriptions: The location of the habitat offsetting is at the southeast corner of the Stewart airport (i.e., Parcel C; 55°55'45.64"N, 129°59'12.64"W). The area is an extension of habitat offsetting that was completed under authorizations 12-HPAC-PA4-00248 and 16-HPAC-00732. Fish sampling will take place in the offsetting habitat as well as at two reference locations. The first location is located upstream of the offsetting (55°56'6.98"N, 129°58'45.75"W) and the second is on a nearby watercourse (55°55'56.55"N, 129°59'14.16"W).

Reporting Requirements:

XR 271 2019

Due Date 12-Sep-20

Terms and Conditions:

Copies of this licence must accompany the collecting personnel, be on board any collecting vessel and be carried by the transport vehicle at all times during collection and transport of samples. The licence must be produced upon the request of a Fishery Officer or Guardian.

This licence authorizes collections to be made by the licensee and employees, volunteers and students of the licensee provided that all persons, other than minors who are engaged in activities under the authority of this licence, are carrying suitable photo identification to be produced upon request of any Fishery Officer or Fishery Guardian.

A breach of licence conditions is a Fisheries Act offence.

This licence may be amended or revoked by the Department prior to the expiry date if deemed necessary.

Prior to sampling and upon completion of any fishing activities the local Fishery Officers of the Department of Fisheries and Oceans must be informed of the exact time, location, purpose and samplers. All fish mortalities resulting from sampling activities must be reported.

Electrofishing is not permitted in the vicinity of spawning salmon or redds. Electrofishing can be severely damaging to eggs and alevins and must be avoided where eggs and alevins may be present. A trained and certified electrofisher operator must be a part of the electrofishing crew. Electroshocking will be avoided in water with a temperature below 5 degrees Celsius. Where this is not possible, all other methods of fish capture will be used prior to electroshocking. Electroshocking is authorized as a last method of collection for salvage purposes only. All fish must be returned to the water unharmed if possible.

It is the responsibility of the licence holder to ensure that samplers are experienced and competent in the fish collection methods authorized in this licence.

All gear left unattended must be clearly labelled with the Licence Number and must not interfere with the public right of navigation.

Release of fish. All non-target fish must be released unharmed into the water body or course from which they originated and as near as possible to the location from which they were captured.



Licence Number: XR 271 2019
Valid From: 12-Aug-2019
Expiry Date: 11-Aug-2020

No specimens may be retained.

This licence requires submission of a final report which is to be sent electronically to DFO.NCSP-PSCN.MPO@dfo-mpo.gc.ca. Refer to the reporting requirements on this licence for due date.

Please refer to the scientific licence number when submitting report.

Reporting Requirements

A written report describing dates of collection, location, DFO statistical management area and subarea, latitude and longitude, scientific name, common name and numbers of organisms or weight in kg. If numbers is an inappropriate measure, is required to be submitted to DFO within 30 days following expiration of this licence.

Section 32 (1) of the federal Species at Risk Act prohibits killing, harming, harassing, capturing or taking an individual of a wildlife species which is listed on Schedule 1 as an extirpated species, an endangered species or a threatened species. Refer to the SARA Public Registry at <http://www.sararegistry.gc.ca> to determine if species at risk may be in your research area and to apply for a permit if required.

Contact the BC Ministry of Forests, Lands, Natural Resources and Rural Development for a licence to collect non-salmon species.

By signing on this document, the person(s) listed below, agree to be bound by the terms and conditions that pertain to each person as an individual and to the group as a whole.

121981

FIN	Licence Holder - Print Name	Signature	Date
-----	-----------------------------	-----------	------

Licence Issued: 07 August 2019

Licence Printed: 07 August 2019
Licence Issued By: CHERA WHEELDON, Fisheries and Oceans Canada
Licence Prepared By: Amber Stuart
Chera Wheeldon